

the magazine for
the contemporary teacher

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Editorial

Cover Story

Museums are heritage sites that display the lives and cultures of people from a bygone era. They are usually on the list of tourists when they visit a new place. Museums are also places that families choose to spend time at on a holiday. In short, most of us think recreation, history, and a storehouse for large collections of objects. How many of us actually look at museums for what they are? How many of us think that they can be spaces for learning? While there is an annual ritual that all schools follow of taking students to a local museum, are these trips planned for learning to happen? Are students informed about what they should look out for? Do museum trips from school end up being like a day out for students and nothing more? Teacher Plus looks at how museums provide innumerable opportunities for us to learn in our three cover stories.

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Who doesn't love chocolates? What makes them irresistible? From ancient rituals to modern-day indulgences, Sujata C writes about why this seemingly humble bean captivates our senses. She presents an educational yet fun project for school children that blends science, history, geography, and more, to learn all about chocolate!

Professional Development
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The Other Side
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Are e-techno schools the future of education? They focus on STEM and promise a 92% success rate in competitive exams. But what are the benefits and pitfalls of this trend? Anuradha C writes about how these tech-integrated institutions are reshaping learning and why one mother uprooted her life to be closer to an e-techno school.

Book Review
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Aruna Sankaranarayanan

Creativity isn't just for artists – it's a vital skill for all fields! Aruna Sankaranarayanan writes about how teachers can nurture creativity in the classroom. She also highlights key characteristics of creative individuals and practical methods to encourage original thinking. Her piece is a must-read for educators looking to inspire the next generation of innovators.

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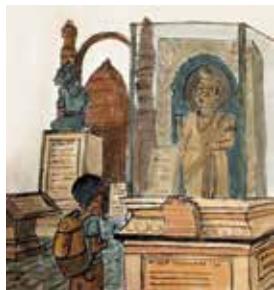


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Yet another beginning



For teachers, beginnings and endings are commonplace. Each year we send off one batch of students and welcome another. We close the report cards of the year and open another stack, columns waiting to be filled. We put away our lesson plans and re-open them, sometimes needing to re-jig something because a new set of textbooks have been recommended, or there has been a major curriculum revision.

Yet, even for the most seasoned of us, a new academic year brings a small frisson of excitement (yes, it may also be accompanied by a feeling that the break was not long enough, or refreshing enough). There will be new faces, and the possibility of new ways of doing things. However many times we have taught that lesson on photosynthesis or those rules of grammar, that chapter on the Kalinga War or the Pythagoras theorem, there's no denying that just having a new set of faces looking up at you will make it interesting...for a few weeks, anyway!

So here we are, at *Teacher Plus*, at our newest beginning. I say "newest" because – like you – we've had a few re-starts and re-boots ourselves. This issue marks one more of those transition points; the era of print has ended, and the age of the digital has begun. We've been through this already, so I will not bore you with the details. Suffice it to say that we are determined to focus on what's ahead, and ensure that we stay in touch with what we have always promised *Teacher Plus* will be – a magazine for *practicing* teachers, and by extension, all those who care about how and what our children are learning, both inside and outside classrooms.

In the weeks to come, we will bring you, in small batches, our stories for July, starting later this week with the stories related to the cover theme: museums as spaces for learning. A museum is a place of exploration and discovery, where you can "see" things jump out of the textbook. Onto a wall or into a glass case, where you can, on occasion, walk through exhibits and touch and feel ideas. A museum can be many things: it can be a living laboratory (like an immersive science museum) or a collection of artefacts that draw you into the past. It can introduce you to aspects of a subject that go beyond a classroom lesson and maybe spark a lifetime of curiosity. It can also be an exercise in understanding how knowledge is built and curated.

Apart from this, our July collection will include many of our familiar columns – Neerja Singh on future-ready skills, C Anuradha on the curious phenomenon of e-techno schools, a fun and a fascinating project on chocolate, among others.

We'd also like to hear from you about your own beginnings – new or otherwise. The *Teacher Plus* website will feature readers' contributions in a special blog, and we welcome you to share your ideas and experiences with others in our community.

Usha Rawat

Can the



It is instructive to start this essay with an amusing recollection from the history of the Government Museum, Chennai (erstwhile Madras Museum) which gives us an insight into the space these institutions have occupied in public consciousness. The museum, founded in 1851 thanks to the efforts of its superintendent Edward Balfour, was physically housed in the same campus as the city's first public zoo. The locals of Madras, to distinguish one from the other, apparently referred to the museum as *cetta college* ('college of the dead') and the neighbouring zoo as *uyir college* ('college of the living'). *Cetta College* – a learning centre devoid of life, a gallery for stuffed animals and inanimate objects. Sadly, little seems to have changed in the imagination of educators over more than a century when it comes to viewing the museum as an active extension of the classroom. What would it take to re-imagine this hoary institution as one that is alive with rich possibilities of learning for young minds?

Neil MacGregor's 2010 radio series, "A History of the World in 100 Objects", a delightful result of a partnership between the BBC and the British Museum, shows us one way in which, in the hands of a creative educator, a museum's collection can serve as a springboard to an exciting investigation of history through material heritage. In 100 episodes of the epic series, each 15-mins in duration and centred on a single artifact, the curators and radio producers attempted to traverse two

Photos: Sakti Prasanna Monhanty
Courtesy: DAV Public School, Pokhariput.

museum be a space of discovery and delight?

Ashwin Prabhu

million years of humanity right up to the present day. The audio content was eventually rendered into text and published as a handy book by Penguin. Since then, there have been a few attempts to create an Indian equivalent of this landmark approach. Devika Cariappa's expansive *A Children's History of India in 100 Objects* and Vidya Dehejia's *India: A Story through 100 Objects* both mirror the approach pioneered by MacGregor – that the story of our past can be understood by interrogating physical artifacts and that there is no better place than the local museum to facilitate this enquiry.

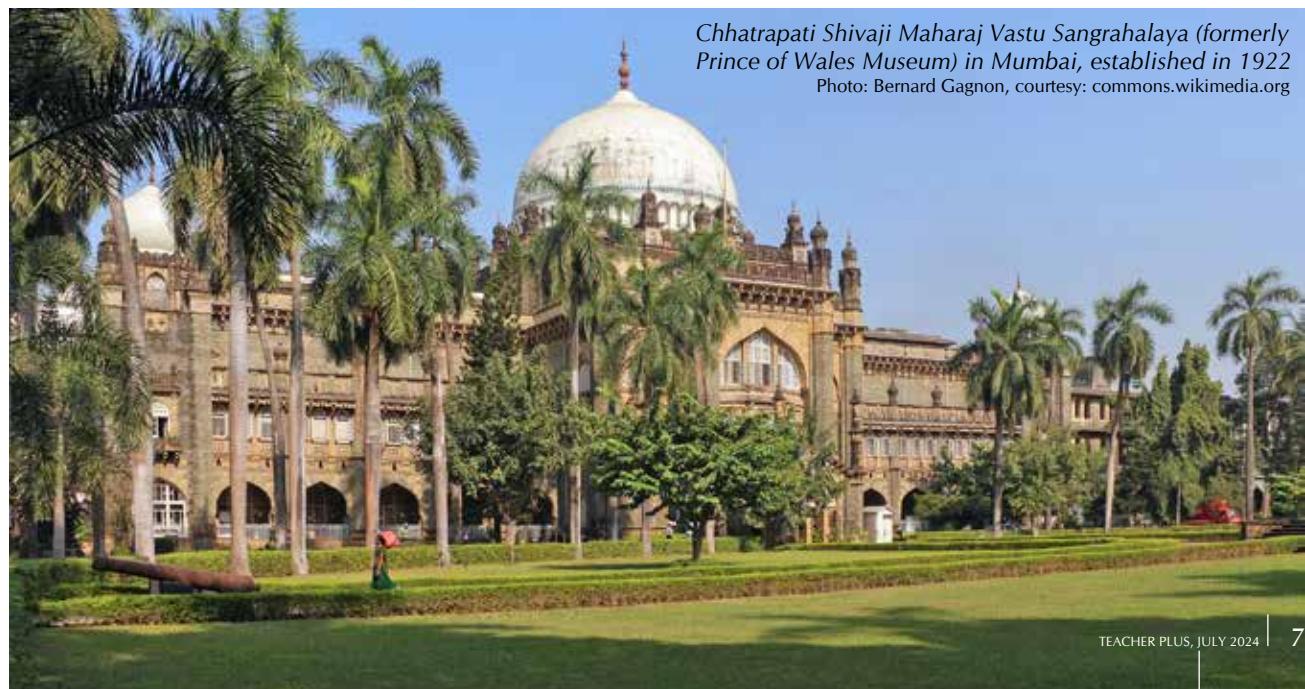
In the West, museums have long been seen to be as "in the service" of the public, and both schools and students have hence been critical beneficiaries of the museum system. A general social culture of volunteering prevails, and serving as weekend docents (volunteer guides) is a favoured pastime of the young and old alike. Fresh university students and retired folk from various professional streams – both embrace the role of acting as guides at the neighbourhood museum and giving back to the

community. Museum curators have dedicated 'Educational Outreach' teams which are constantly envisioning ways in which the museum's exhibitions can be integrated into the school curriculum and looking for opportunities to welcome school students into their galleries.

Here, in India, we've been somewhat half-hearted in our attempt to leverage the museum as a rich and vibrant learning space for the young. School trips to the museum, if they happen at all, are uninspiring affairs with students being lined up and trooped past a series of exhibits with little or no engagement planned. Silence is of paramount importance and consequently, questions are frowned upon. Children are expected to read and learn solely from the information boards accompanying the exhibits – many of which are dry and textbook-like without directly referencing the exhibit itself. And responsible for this situation is not just a complete absence of motivation in the museum authorities to attract and engage with new audiences, but also an unfortunate poverty of imagination in the teacher.

Chhatrapati Shivaji Maharaj Vastu Sangrahalaya (formerly Prince of Wales Museum) in Mumbai, established in 1922

Photo: Bernard Gagnon, courtesy: commons.wikimedia.org





Any meaningful change in this status quo can only happen when as educators we are interested in answering the question – what can museums offer to the classroom?

The starting point perhaps is to appreciate that any history cannot be told only through texts. And the reason for this is quite elementary – texts have not always existed, especially when we want to understand cultures of the distant past. And when texts and the written word finally did emerge, they emerged only in a few pockets of ‘civilizations’,

excluding large swathes of the world. A robust history therefore is a coming together of both ‘texts’ and ‘objects’. Objects constitute an entire material history of humanity which has much to offer to the observant and interested learner. They hold within them dates and years, reigns of kings, periods of great tumult and progress, ages of invention, creativity and enterprise. Through an object, a discerning viewer and student can investigate purpose, beliefs, and power – its use and abuse. Through a well-curated and anchored tour of physical heritage, one can journey along a time arc of thousands of years in a single afternoon.

The other aspect is to recognize that children learn not just through ‘content’ but also ‘contact’. Physical, first-hand contact brings along with it an experiential quality which the best of textbooks struggle to achieve. A skilled museum curator will know how to place an artifact in its social, historical, and cultural context using the object itself and carefully chosen accompanying text, visuals, audio, and video. The viewer is thus left with insight not just limited to the physical object itself, but which emplaces it in a larger, more ‘real’ world.

Finally, when as educators we begin to integrate museums and museum visits into our lesson plans and pedagogy, it is vital to keep in mind a few pointers to ensure a learning-filled trip for the children:

- Remember to keep the batch size small for the visit. Not more than 25-30 children. If the class size is larger than this, then it is best to organize the class into smaller batches and plan separate trips for each batch. Another possibility is to have each batch visit a different museum gallery on the same day anchored by separate teachers.



Two *hiyang hiren* watercrafts flanked by two *tanna hi* watercrafts, inside the Hijagang Museum in the Kangla Fort, Imphal

Photo: Haoreima, courtesy: commons.wikimedia.org



- Spend time orienting the students to what they will be seeing prior to the visit. Some basic familiarity with the museum, its layout, and its exhibits can go a long way in ensuring better learning outcomes on the actual trip.

- Do not be ambitious. If the museum you are visiting is a large, sprawling public institution, it is better to spend a whole morning in a single

gallery than attempt to cover the entire museum in the same day. If the museum is in the same city your school is in, then you can and should plan multiple visits over a school year for the class rather than a 'one-off' trip.

- Make multiple visits by yourself to the galleries you are going to take your students to. Prepare specific worksheets for key exhibits where you would like the children to pause and spend time. The worksheet should be for individual work and have exercises which encourage first-hand observation, provoke further questions from the child, and help stoke wonder. Make sure you include a few sketching and reflection exercises in the worksheet.
- Design the museum visit with a break in the middle. After snacks and water, gather the children around and make time for coming together as a group. Allow the children to share what they have learnt, ask clarification questions of each other, go over their responses to the worksheet, and then orient them towards what to expect in the second half of the visit.
- Create strong linkages between what the students 'see' and 'learn' on the visit with their academic curriculum. Assign follow-up reading work and exercises from the textbook after the visit. Very often these museum visits tend to become stand-alone trips quite disconnected from the daily transactions of the classroom.
- In all of this, do not forget that children also need to have fun while learning. Allow for spontaneity during the trips, impromptu wandering into unplanned galleries, and for children to linger around exhibits that appeal to them for as long as they want.



Chennai Rail Museum, established in 2002.

Photo: Lakshmi Kiran, courtesy: commons.wikimedia.org

It is an opportune time to be an educator in this country now when we are gradually broadening our definitions of education and seeing thoughtfully designed new public spaces for learning emerge. In addition to the grand public museums which are our colonial legacy, there are several other state-owned and private museums which have come up in the past few years – the Bihar Museum in Patna, the Science Museum, the Museum of Art and Photography, and the Indian Music Experience Project in Bangalore, Dakshina Chitra, the museum on art, architecture, crafts and performing arts in Chennai, and the intriguingly named Museum of Solutions in Mumbai, an exploratory space designed especially for children – to name but just a few.

Etymologically speaking ("the seat of the muses"), by pursuing imaginative and energetic pedagogy, we now have an opportunity to help museums reclaim their original roots as places of contemplation and inspiration, for ourselves and for our children.

The author taught English and history at The School KFI for five years between 2014-19. The time he spent in school allowed him to examine his questions around learning, growing, and finding one's place in the world, and his first book *Classroom With A View – Notes from the Krishnamurti schools* published by Tara Books in 2022 is an outcome of that engagement. He is very interested in exploring new ways of teaching the social sciences and his second book *Sculpted Stones – Mysteries of Mamallapuram* by Tulika Books is one illustration of an approach which is quite unconventional. He can be reached at <ashwin.prabhu@gmail.com>.

Related articles from our archives

- <https://www.teacherplus.org/museums-that-teach/>
- <https://www.teacherplus.org/museums-as-learning-spaces/>

The



Photos courtesy: Sowmya Ravindranath

When I asked a group of middle graders what they thought of a museum and how similar or different it is to a library, I got an eclectic set of responses – from functional similarities of both operating under visiting hours to deeper perspectives on both being keepers of memories and histories. An exercise to know about their experiences of museums revealed that a majority of them understood the merit of being present and observant in a museum only belatedly.

Each academic year, the school's library program is designed to highlight one aspect of the library. The year

LOUVRE
I was quite young when I ~~was~~ ^{had} to visit the Louvre.
I remember standing near by, not wanting
to go there but wishing for Disneyland.
Few years ~~later~~ later, I learned about all the
famous paintings and completely regretting
not going inside!!

Louvre: Response from a student

library as museum

Sowmya Ravindranath

we focused on 'Shared Spaces', we celebrated experiences of coming together as a community and engaged in conversations around individual and collective identities, caste, and representation. The following year, the attempt was to bring attention to the archival quality of the library. A school that is over four decades old, stores in its shelves, more than just books and stories. That a library is a repository of texts, memories, and initiatives intrigued my students.

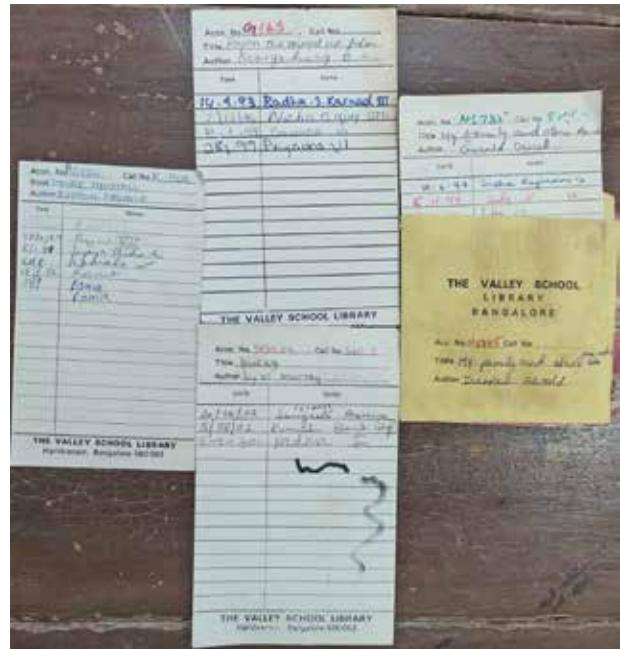
Collection and curation

Tracing some of the first books to be catalogued and shelved, we set out to explore how the collection had grown over the years. In the back issues of the in-house magazine, we found reviews of books that were added to the collection that year, and subsequently found a few of them in the shelves. We looked at the earlier system of borrowing cards and connected with a few former students who had borrowed particular books. The movement of time and its effect on the collection became central to our conversations. This was an invitation to look at the library as an archive of thoughts, initiated and curated over four decades.

Reading and browsing

This shifting of lens allowed my students to engage in the library a little more deeply. Their browsing seemed more purposeful, intrigued by the idea of encountering something special in the shelves. There was a layer of reverence added to their relationship with the library; a reverence fuelled by curiosity.

Just as a museum calls you to slow down and observe, the library became a space where children explored their capacity to stay with their self, and shelf. To connect these dots of webbed ideas, we set out to read a book together over the next few months. Uncovering a chapter each week, we read the novel *From the Mixed-up Files of Mrs. Basil E Frankweiler* by EL Konigsburg. Set in the Metropolitan Museum of Art (The Met), New York, the book recounts the adventures of runaway siblings Claudia and Jamie Kincaid. The adventurous spirit of the rebellious characters who hide out in



Book inserts used in the old borrowing system



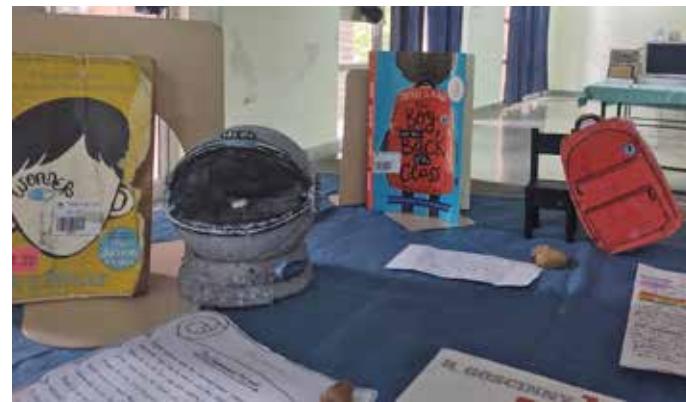
Books displayed when the characters entered the Egyptian Wing

a museum had my students hooked from the first page. As we read about the Kincaid siblings visiting the different galleries in the museum, we traced their movement on a map. Comparing maps from the book and The Met website, we observed the changes that were made to the layout of the present day. The characters' entry into specific galleries was marked with immersing in books associated with the topic or art form. From Renaissance art to Egyptian civilization, we set up book displays to get familiar with the museum's collection, keeping pace with the characters' explorations.

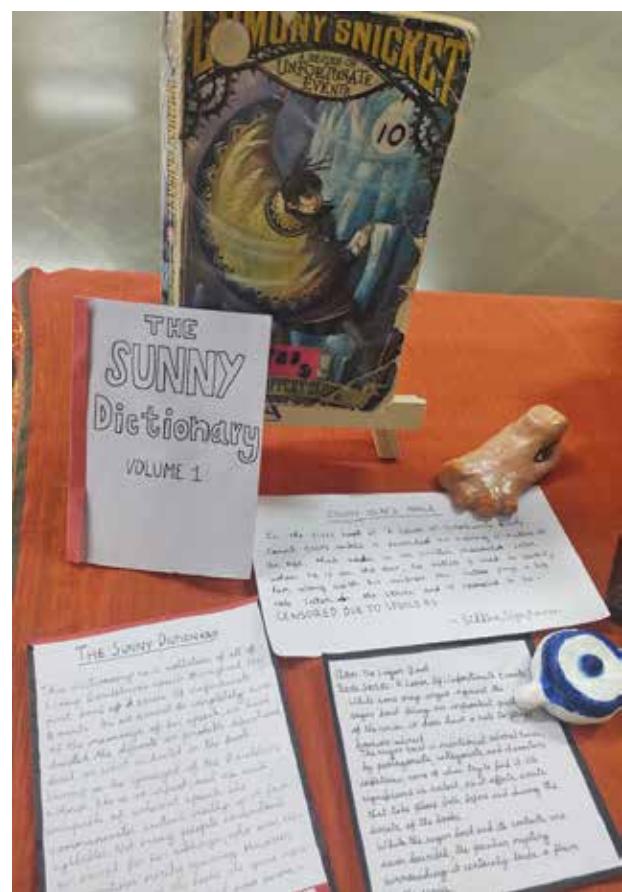
The curation drew them in, sneaking history and non-fiction books into their reading and swinging open doors of receptivity for reluctant readers. Days leading up to their library class were brimming with an eagerness – to get back to the book and continue on the adventures, experienced vicariously. One of the children remarked that she can't bear to think that the Kincaid siblings will continue on their exploits without her; she urged to get back to the book soon. The most rewarding factor of reading a book with a group, over a few months is the collective excitement it builds; like a slow brew it settles into your thinking and bubbles over every now and then. When children are as eager as they are, to stop them from reading ahead or peeking in is bittersweet. Despite their wishes and friendly threats of acquiring the book, the children stayed the course and waited for the book to be unravelled, week on week. The plot had us at the edge of our seats and the lead characters' temporal quandaries gave us much to deliberate upon. However, it was the resolve and resourcefulness of the characters that sowed a seed of wonder – about museums and self-study. A few weeks later, a museum visit was organized for one of the grades. *From the Mixed-up Files of Mrs. Basil E Frankweiler* had not only inspired the children to observe if there were any possible hide-out spots in the museum, but also made them a tad more present, to go through a collection. Some of them came back and revealed that they had paid closer attention to insignias and the back of display objects.

Setting up a museum

In the words of art critic Jerry Saltz, 'Museums are wormholes to other worlds'. Wormholes are exactly what we set out to create. As an ode to the months of reading and reckoning, we planned to set up our own museum, and thus *Museum of Bookish Things* was born. The central idea of this museum, in an exhibition format, was to host a platform to showcase objects that are inspired by books. This was an invitation to create and interpret – objects

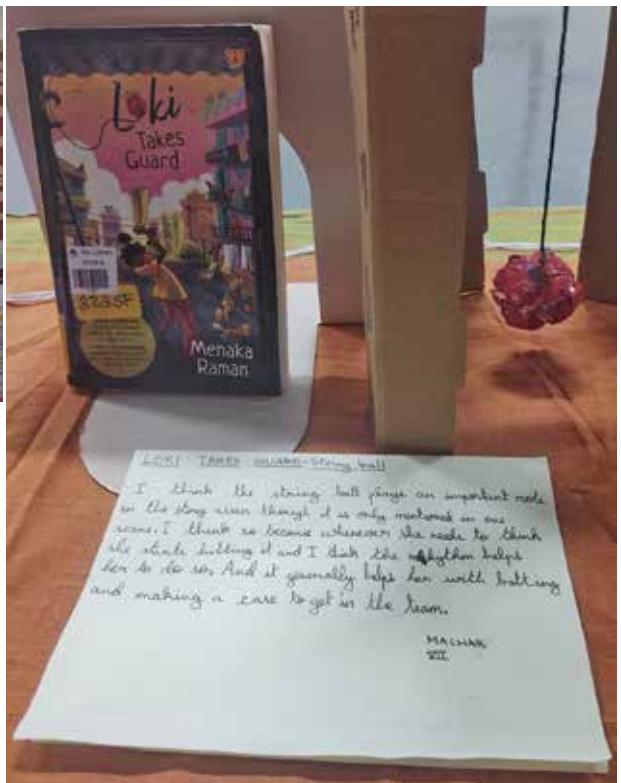


Objects and books on display at the Museum of Bookish Things



The Lemony Snicket book series offered opportunities to collaborate with friends

culled from a process of imagination. The brief was simple – they should look for inspiration from books that count as their most memorable. Once they navigated the political significance of choice, the children settled into creation mode. Working solo and in small groups, they found tools, items, and scenes from books and shaped them into life. Pieces



Objects presented personal interpretations of students



in wood, clay, metal, paper, and cardboard came announcing their stories, as they were written by the authors and as they were interpreted by the makers.

Keeping to the handmade theme, this experience made room for a critical study of the book, in a more visceral way. The flow of the creative process

facilitated a conversance of the reader and the creator. As they set out to create objects, children had to deliberate on how the character used them and how the object feels in their hand, therefore allowing a more intimate understanding of the book. What emerged from this exercise was a rich and remarkable collection of bookish things – objects from the fantasy landscape, items from realistic realms, scenes and scenarios of novels, representation of food in fiction, depictions of war memorabilia and much more. The bookish things were also maps of personal strivings – what was put out was what was gleaned and pursued. Paired with their respective books, objects came with little notes describing their significance in the plot, making the whole process of viewing cohesive and interesting.

A display of this kind meant that there in nothing frigid or indifferent; everyone is drawn in. Open for a week, the *Museum of Bookish Things* created a buzz in school. Each grade visited the museum, entering different worldviews and engaging with the idea of discovering something new. This was also a call to slow down — to observe and interact with the presented perspective. Beckoned by the myriad conceptions of wonder, the museum offered something for everyone. Books related to the objects on display were now in the limelight; wanted and waitlisted, the demand to borrow them skyrocketed. A heightened sense of borrowing can only mean that the library was a firmament of interest.

Library: a portal to wonder

To call a library a place for solitude or quietude can limit the potential of a vibrant space that can reverberate with a sense of community. The *Museum of Bookish Things* was a fortunate reminder that the pursuit of learning doesn't always come solo or quietly. Right from making a poster and handling announcements to setting up an aesthetic display and packing up, the museum was completely handled by the children. The days preceding the showcase was replete with intentional exuberance and book joy. In all this, what remained in the wakeful state is a sense of wonder. Wonder that can be explored with active engagement, wonder that is playful, wonder that is purposeful, wonder that brings joy and learning. I hope my students will continue to seek it.

The author is a library educator at The Valley School, Bangalore. She is deeply interested in making libraries safe spaces for children to explore their inner world and outer world. She can be reached at <sowmya.ravindranath@thevalleyschool.info>.



A little museum with BIG ideas!

Nupur Hukmani

Lift me. I can't see!", "Tell me what is this?", "And that there?" I remember how excited my 7-year-old self was when I first visited a museum. I grew up in the 90s, obviously without the internet. Having a computer was a privilege only few could afford. Reading books, watching educational programs on national television once a week, skimming through newspapers, or going to a library were some of the options available to us as kids to learn more about the world around us. That day at the museum with my grandmother was one of the happiest days of my childhood. My senses were captured and my head was bursting with so many questions! That day, I must have asked my grandmother, "What is this?" an infinite number of times. "Tell me what is this?"

became my favourite question to ask then, and even now as an educator teaching middle and high school children, it is my favourite question to ask and to be asked.

Today the world has so many more opportunities of access and exposure for children and adults alike. The internet is a door to unlimited knowledge. But what is still lacking is a structured presentation of the world all in one place – its birth, history, evolution, subsequent technological and industrial progress, problems that accompanied them, and social issues like war, slavery, caste system, and other human rights violations. Knowing the world and its problems is one thing, but as an individual, it is a daunting task

to understand these problems and wonder what one can do about them. Having a guide would not only help us understand the world better but also help us navigate our future in a way we don't keep repeating the mistakes of the past.

A museum is a space where you can experience the conservation, documentation, research, and display of different objects related to art, history, social justice, science, technology, and geography. The aim of a museum is not just to display, but also to pass these objects down to the next generation to ensure that history is not lost, to make connections in human, cultural and scientific development, and support discoveries and inventions. Above all, it is a space where everyone from a wide-eyed 7-year-old to the oldest adult can feel curiosity, wonder, and all things exciting related to something new. And the Little Museum of the World's virtual 3D tour that I recently took did exactly that!

The Little Museum of the World is a one-of-a-kind museum concept in Hong Kong that was founded by Christian Pilard after a lifetime of curious inquiry, obsessive collection, and well-researched documentation. Christian is also the founder and president of Eco-Sys Action – a nature conservation, health, and education-based non-profit. The Little Museum of the World prides itself on being a museum of meaningful actions. Its mission is “*to help more humanitarian, environmental and cultural projects around the world while developing and inspiring a worldwide community of true citizens of the world, young and old people alike, who want to make a lasting difference on this planet*”. Understanding, caring, and finding solutions are in the blueprint of the museum.

While I was not lucky enough to be able to travel to Hong Kong, I did get an opportunity to set out on a virtual tour of the museum. On a breezy Sunday afternoon, I sat at my desk with my pen and paper, headphones, and laptop, super excited about going on this journey of wonder, exploration, learning, and reflection from the comfort of my home. I felt the same excitement I had felt as a child on museum visit days. Priced reasonably, The Little Museum of the World's 3D virtual tour is an excursion of 120 enchanting artifacts grouped under various themes such as *early rocks, primitive life, meteorites, volcano rock, older fossils, Neolithic tools, history of civilizations, slavery, literature, photography travel explorations, the history and the current reality of the exploitation of the Earth, the different wars of the world, space exploration, cinema, art, sport, and music just to name a few!*



First humans tools

The tour starts with an introduction to the museum's mascot Boopy – an exotic orange sparrow – who is also the narrator of the artifacts along with Pilard. Boopy introduces itself as a cosmonaut, an eco-detective, and an inspirational leader, urging the visitor to step into this world with the same attitude! Along with Boopy, there are three other pillars of the Little Museum of the World – The Little Prince, Jules Verne, and Nelson Mandela. The Little Prince's philosophy of feeling with the heart (“*It is only with one's heart that one can see clearly. What is essential is invisible to the eye*”), Jules Verne's vision and imagination, (“*Anything one man can imagine, other men can make*”) and Nelson Mandela's reconciliation (*It is in your hands, to make a better world for all who live in it*) underline the intent, collection, documentation and values of the museum. Each artifact pops up as a short informational write-up in audio-visual format along with accompanying photographs and/or videos.

That Sunday I was immersed in a joyful and experiential journey of learning like no other. I learned about the history of the Earth from the





Baby Psittacosaurus



Rex tooth



Sauropod bone

oldest rock at the museum called Zircon Crystals (3.5 billion years old!) to how life, continents, and oceans came to be (my favorite was the story of the formation of the Anak Krakatoa – meaning "Child of Krakatoa", an island formed due to the eruption of the Krakatoa volcano in Indonesia). I was fascinated by the artifacts describing the chronology of the evolution of life. I learned of living fossils like the baby horseshoe crab that has 10 eyes, 10 legs, and blue blood and its place in the evolutionary journey of life on Earth. I was awestruck by the incredible microscopic world of amber. Did

you know that amber is a fossilized tree resin that is used to make jewellery? But more importantly, the resin attracts small insects and other flora and fauna in its sticky liquid. Over many years, the resin has helped in fossilizing various flora and fauna. No wonder then that amber has been nicknamed the "little time machine".

Post learning about early life, I entered the fascinating and terrifying world of dinosaurs! An Oviraptor egg, a humongous tibia bone from a Sauropod from Madagascar, a *Tyrannosaurus* tooth (that measures the size of a school bus!), and a fossil of a juvenile *Psittacosaurus*, the Little Museum of the World has them all. I was lost in a world from millions of years ago that would have seemed made up had it not been for the photographs of these fossils and the accompanying archaeological explanation.

From the world of dinosaurs, I was beckoned into the Ice Age and the accompanying rise of modern species. I was also introduced to the "first humans" and their activities. The tools they made changed the world forever and led to the rise of modern society. Ingenious inventions and discoveries are a hallmark of this period and many of those are on display in the Little Museum of the World; how amazing is that? Inventions, discoveries, and the growth of civilizations brought their own



Once upon a forest



Muhammad Ali Everlast Gloves

challenges. Travel explorations of Marco Polo, Ibn Battuta, Zhen He, Christopher Columbus, and Vasco De Gama ushered in a new, globally connected world promoting trade and economy. However, it also brought with it social and political problems like slavery, the history and generational effects of which we must never forget. The museum has on display artifacts related to the abolitionist movement in America such as an original photograph of Wendell Phillips (American abolitionist). It also houses many objects like beads and necklaces that have heart-wrenching stories behind them about how slaves were treated. Besides objects related to slavery, the museum takes you through several artifacts related to a range of well-known disasters like the world wars and the Titanic and the Hindenburg tragedies.

But all is not bleak and dreary. The museum houses many artifacts related to sports like the legend Muhammad Ali's Everlast Gloves or a postcard signed by the famous athlete Jesse Owens. The fashion, cinema, music, and art rooms are equally mesmerizing. On the one hand, there is the *freedom table* displaying artifacts related to music, and on the other, there is a corner paying homage to the popular comic strip *Calvin and Hobbes*. If you are a movie buff, there is so much to witness from the history of cinema to original photographs of *Star Trek* actors! Literature buffs can visit the assigned room and see original and special editions of some wonderful books.

I can go on about all the amazing artifacts that I engaged with, but I would urge the reader to

experience all of this for themselves. The tour can technically get done in a couple of hours. However, truth be told, you can spend hours looking at the artifacts, reading their context and story, taking notes, and doing further research. Once you enter the museum – the world is your oyster!

That Sunday, I felt like a curious child again. I also felt like an excited educator who has come up with another creative idea to facilitate in the classroom. If you believe in values like resilience, imagination, non-violence, peace, creativity, and equality, I invite you to go on this wonderful trip. I hope my readers will take the time out to visit this little museum with BIG ideas. Whether you are a child, a parent, an older sibling, or an educator, it is a memorable and enriching experience and has a lot in store for everyone!

For more details, check out:
<https://littlemuseumoftheworld.com/>

Reference: <https://magazines.odisha.gov.in/journal/jounalvol1/pdf/orhj-10.pdf>

The author holds a Masters in psychology and has been an educator for the last 10 years. She is currently working as an Assistant School Leader at a school in Pune. When she is not teaching or writing, she loves reading, doing yoga, and long-distance running. She can be reached at <nupurhukmani12@gmail.com>.

The three Cs of modern education

Neerja Singh

We are in an era that is defined by rapid technological advancement, globalization, and societal shifts. These phenomena are throwing formidable challenges at the traditional model of education. The evolving demands of the workforce demand more than just textbook knowledge from the employees. It has therefore become essential for educators to cultivate three indispensable skills in the young – critical thinking, creativity, and collaboration, so that they may thrive in an increasingly complex world.

How may these skills be nurtured in educational settings? What strategies would prepare students for the challenges of the future?

Critical thinking is the ability to analyze information objectively, evaluate its credibility, and make informed decisions. In today's information-rich society, where misinformation spreads rapidly, critical thinking is more vital than ever. Students who develop this ability become adept at questioning assumptions, examining evidence, and reasoning logically.

Imagine a high school classroom discussing a controversial social issue like climate change. Instead of passively accepting information presented by the teacher or media, students engage in critical discussions, evaluating different perspectives, scrutinizing data, and forming their own opinions based on evidence. This not only enhances their understanding of the topic but also cultivates their ability to think independently.

Critical thinking is the cornerstone of effective decision-making, problem-solving, and analytical reasoning. It is the only way for students to make sense of the information-saturated landscape they are surrounded by today. And educators play a pivotal role in fostering a culture of critical inquiry within classrooms.

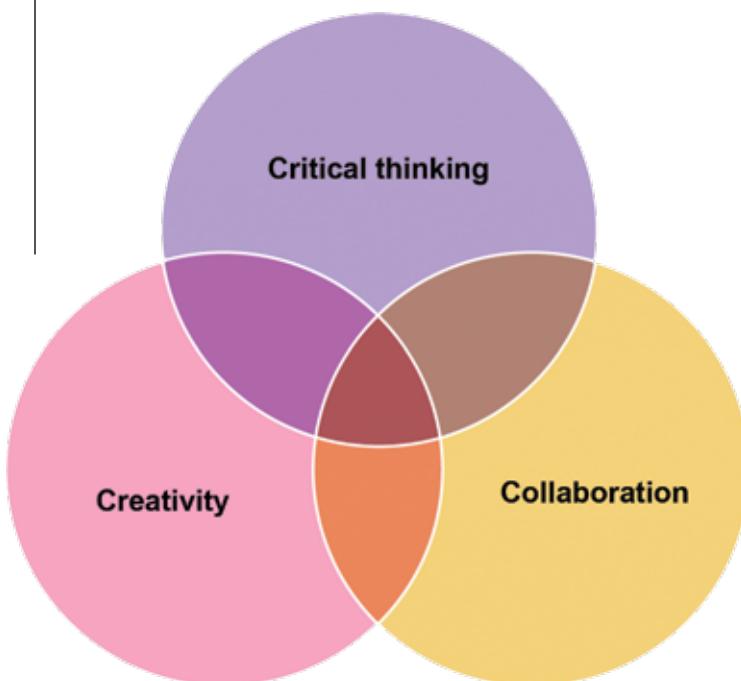
One approach is to integrate inquiry-based learning methodologies that encourage students to ask questions, challenge assumptions, and explore multiple perspectives. By engaging in debates, discussions, and projects that require evidence-

based reasoning, students develop the ability to think critically and make informed judgments.

Moreover, teaching critical thinking involves nurturing metacognitive skills – awareness of one's own thought processes. Through reflection and self-assessment, students learn to identify biases, assess the reliability of sources, and revise their thinking based on new information. By embedding critical thinking across the curriculum, educators empower students to navigate complexities and adapt to diverse challenges.

Creativity is the second crucial C of modern education. It is the ability to think divergently, generate original ideas, and solve problems innovatively. In today's rapidly changing world, where automation is reshaping industries and creating new challenges, creativity has emerged as a prized asset. Students who harness their creative potential are better equipped to adapt to change, think outside the box, and innovate solutions to complex problems.

Imagine a middle school art class where students are tasked with creating a piece of multimedia artwork inspired by a current social issue. Through this project,



students not only explore their artistic abilities but also learn to express their ideas creatively, communicate messages effectively, and address real-world issues through innovative means. This nurtures their creative thinking skills and prepares them to become adaptable problem solvers in any field.

Creativity is the catalyst for innovation, entrepreneurship, and adaptability in an ever-changing world. Yet, traditional educational models often prioritize rote memorization over creative expression. To unlock students' creative potential, educators must create environments that nurture curiosity, experimentation, and divergent thinking.

One strategy is to incorporate project-based learning experiences that encourage students to solve real-world problems in creative ways. Whether designing inventions, composing music, or crafting visual artworks, students learn to think imaginatively and embrace ambiguity.

Educators can further leverage technology as a tool for creative expression. From digital media production to coding and design, technology offers numerous avenues for students to unleash their creativity and collaborate on interdisciplinary projects. It is by celebrating diversity of thought and encouraging risk-taking that educators cultivate a culture where creativity thrives, empowering students to become innovators and change-makers.

The third crucial C of modern education is collaboration. It is the ability to work effectively with others, communicate ideas, and leverage diverse perspectives to achieve common goals. In today's interconnected world, where globalization and technology facilitate collaboration across geographical boundaries, the ability to collaborate is paramount. Students who excel in collaboration develop strong interpersonal skills, empathy, and an appreciation for teamwork.

Picture a group of high-school students participating in a project-based learning activity where they are tasked with designing and building a sustainable community garden for their school. In this collaborative endeavour, students assume different roles, delegate tasks, and coordinate efforts to bring their vision to life. Through this experience, they not only learn to communicate effectively but also develop essential teamwork skills such as leadership, compromise, and conflict resolution.

Collaboration has emerged as a vital skill for success in a hyperconnected world. Whether in the workplace or within communities, the ability to collaborate

effectively is essential for tackling complex challenges and driving collective progress. And educators can foster collaboration by incorporating cooperative learning structures that promote teamwork, communication, and conflict resolution skills. Through group projects, peer-to-peer feedback, and collaborative problem-solving tasks, students learn to leverage their collective strengths and perspectives.

In addition, global collaboration initiatives provide students with opportunities to connect with peers from diverse backgrounds, fostering cross-cultural understanding and empathy. Virtual exchange programs, joint research projects, and international partnerships broaden students' horizons and prepare them for global citizenship. By emphasizing the value of collaboration and nurturing interpersonal skills, educators equip students with the tools to navigate diverse social dynamics and work collaboratively towards common goals.

The three Cs of modern education – critical thinking, creativity, and collaboration – are indispensable skills that empower students to thrive in the complex and interconnected world of the 21st century. By fostering these skills, educators can prepare students not only for academic success but also for lifelong learning and meaningful engagement in society. As we continue to adapt to the challenges and opportunities of the digital age, prioritizing the development of these skills becomes imperative in shaping a future generation equipped to tackle the unknown with confidence and resilience.

In today's world, the role of education extends beyond imparting knowledge to cultivating essential skills for lifelong success. Through inquiry-based learning, project-based experiences, and collaborative initiatives, educators can create dynamic learning environments where students develop the skills and mindset needed to navigate ambiguity, innovate boldly, and collaborate effectively. As we look towards the future, the smart thing to do is to envision an educational landscape where every student is empowered to think critically, create passionately, and collaborate purposefully – where education becomes not only a preparation for life but a lifelong journey of growth and discovery.

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The 'outclass' plug-in

Meera Bhuvanesh



Photos courtesy: Meera Bhuvanesh

What is education? It is essentially the art of learning, not only from books, but from life. The printed word has become consumingly all-important. You are learning what other people think, their opinions, their values, their judgements and a variety of their innumerable experiences. The library is more important than the man who has the library.

— J Krishnamurthy

In the pleasant and parched fall of October, 37 students of class XI with two facilitators hopped on to a bus from Coimbatore, on a 5-day trip, to Yercaud, a popular hill station in the Salem district of Tamil Nadu. This camp is called the 'outclass' program. Students look at camps or field-trips as an escape from the daily churn of a routine school day. It is also assumed that camps and excursions are "no-study hours" and no learning takes place. The thought that learning happens all the time seldom dawns on most of us.

This camp is compulsory for all the students of class XI in our school; if anyone wants to opt out, it is allowed only under unavoidable circumstances. It is an adventure camp and intended at self-learning. While it is called the Self Learning Camp (SLC), a more appropriate name probably is the 'Self-Finding' camp. Being in a conventional day-school, students are not familiar with overnight stays and long travels with school mates. Considering the weather and climate patterns in Yercaud, the camp is slated in the month of October every year. After almost two years of online life courtesy COVID; students were excited for the SLC. They were not aware that the experience was going to push them to the edge, teach them to survive with what they had and make-do with whatever was available. They had the entire itinerary, but none of us could guess exactly, what was in store for the students.

Another batch had been to the same camp some years ago, so the teachers had some idea. Our school has tied up with an organization called inme, which organizes adventure camps for children and adolescents. (<https://inme.in/>)

This camp had learning goals; team work, team spirit, trust-building among peers, undertaking prompt action when required, identifying the need of the hour, problem solving, and the best one was reflecting at the end of the day. Overall, the highlights of the camp were life skills, team-building, and navigation skills

– navigating through tasks, also among and within teams. Besides, it was five days of “no phones”. There was no mobile network; one had to climb a hill with a rocky pathway to get some network to contact school authorities or any such.

On day 1, we reached the camp at around 1:00 pm. The camp is inside a forest, in the midst of a coffee estate. It is a 13 km ride inside the jungle from Yercaud on rutted roads. The jungles of the Servarayan or Shevarorys range of hills in the Eastern Ghats at an altitude of 4,969 feet above sea level. The jungles are locally called as the *Sholais*. The *Sholaikaadu* (forests of Sholas) are the covers of short tropical montane forests found in the valleys of higher mountains and grasslands of South India.

After a resplendent lunch where they abided by the zero-food wastage policy, the students were requested to wash their respective plates. A checking inspector, one of the instructors or kitchen staff, then checked if the plates were clean enough. No left-over food should be on the plate, each camp member is expected to finish all the food they have taken. This is to instill a sense of value for food and also to encourage small servings. If plates are not clean to set standards, then the inmates are sent back for cleaning them again! Due care was taken about water usage also; four tubs with water were kept on different tree trunks and finally the clean plates were kept in a basket for sun-drying. Subsequently, students assembled and they were given detailed instructions regarding the dos and don’ts of the camp by the *inme* campus chief.

Two groups were formed and each group was asked to work on their goals. The students had to list out their expectations from the camp. The result was on expected



lines, students made use of words and phrases like relaxing, having fun, enjoying with friends and so on. The camp instructors made sure that at times, the "friends" were in different teams, courtesy the two facilitators from school.

The students were put up in tents, they had to sleep in sleeping bags, either personal or those provided by camp organizers, on the tent floors and had common toilets to share. They would choose their tent mate. To our surprise within a couple of days there were quite a few requests for change of tents. Hence, many students ascertained that more often than not we assume that we are getting along with a particular person, but only when we travel or stay together with them for long stretches of time, do we figure out that we may have different expectations or wavelengths.

Only once the change of tents was allowed, and after that camp mates were expected to manage, adjust, and keep going. Many of them had never been told some of these terms and initially they faced difficulties.

As mentioned earlier reflection at the end of each day was special. Students are requested to silently sit alone, each of them had to find their cozy-corner, a place of their choice around the campus and make diary entries. A well-designed diary with thought-provoking questions had been given and the students had to self-analyze their day.

This activity is somewhat analogous to 'Asthachal' practiced at the Krishnamurti Schools. It is a transitory noiselessness and quietude spent with self

at sundown. I have observed that students find it difficult to keep quiet for that much time.

Day 2 was all about enjoying the journey and not worrying about the indents and chasms on the way. It had rained the whole night, so rock-climbing was replaced with rope-climbing.

At the outset the activity came across as an adventurous task but it turned out to be a trust-building activity. It was designed in such a way that only if both participants climb together, they can reach the top. This activity was named 'Friendly Ladder'. Another activity on the same lines that the students tried was the 'Big V – Walk'. In this activity, the 'V' is the shape of the commando ropes tied to a tree trunk on which the students had to walk and balance, holding and depending on each other to survive on the rope and complete the walk. Before the climb, they were given protective head-gears as well. The bustle was intended to develop physical and mental strength to overcome obstacles, along with team work.

With no gadgets and absence of city noise, the sounds of insects, birds, and rain drops appeared louder. On the mornings of days 3 and 4, students woke up to a heavy drizzle and had to give the power up activities a miss. They stayed indoors till the rains subsided and then got ready and finally walked out for their activity sessions slated for the day. The two groups interchanged the activities performed so they get the chance to try it all. Here we learned to perform in adverse conditions. However well planned we are, we cannot do





anything about what is beyond our control and it is in these situations that we learn true life-lessons.

The tree jumping act required the students to climb a tree using ropes with harness tied, and once they reached up a certain height, they had to jump down in a stream. Students were mentally and physically prepared for this activity. Certainly, it was something that almost no one had ever experienced. Some who were not ready initially watched others jump and in the end we all tried it at-least once, including the teachers. The back-packing skills and navigating the forests with the help of a compass were tasks for learning team work, behaviour in a group, value for material things, and learning to work with a group of people who perhaps are not so familiar with each other, even if they have been schoolmates for long.

Sometimes it is necessary to take the road less travelled, to unravel what holds us back from trying new things. The most pivotal rule and principle to survive in the wild is Leave No Trace (LNT). Therefore, before we all left the campsite, we cleaned the space thoroughly. Students were asked to gather for a session of closure and reflection on day 5. This session was aimed at team building and sharing of understandings from the five days of camping. Students opened up about their experiences and indulged in some serious self-reflection and the key thrusts from their involvement in the wilderness. Every student in small groups reflected on their learning and things or habits that

would they leave behind and new habits they would develop from the life lessons they learnt at the camp. A sense of calmness had set in and so had a tighter bond amongst them.

The peaceful and serene faces of the students told a story of self-learning that textbooks may not be able to impart. There was a clear image of transformation among students which was remarkable to see. This encounter made them realize the importance of organizing skills, team play, trust building and accommodation forfeat in life ahead. With cherished memories and an introduction to a set of significant life skills, we headed for the roads that took us back home.

All of us retain more of what we practically apply in life, but theory cannot be completely discarded either. True facilitators try and bridge these gaps for students to cross-over and then inspire the students to create their felicitous learning patterns and spaces.

"There is no end to education. It is not that you read a book, pass an examination, and finish with education. The whole of life, from the moment you are born to the moment you die, is a process of learning." – J Krishnamurti

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Rebuilding hope

A journey with a government school

Sushmita Aripirala

Schools are institutions that preserve knowledge, inspire curiosity, and foster a love for learning. However, at the beginning of every academic year, two common themes dominate the news: exorbitant fees collected by private schools and the dilapidated conditions of government schools. These issues grab attention for a while, only to fade away, moving to the last pages of newspapers and eventually out of sight.

Have you ever wondered why government schools are in such a state, despite the presence of around 400,000 NGOs working tirelessly to improve education in these schools? Do we really need so many organizations to address the issue? Why do most corporates allocate their CSR budgets

to education by adopting government schools? Until two generations ago, people only went to government schools and they did well in life. So, how and why did the state of these schools change?

For almost a decade, I have been working with various government schools. Wherever I went, I encountered poor infrastructure – insufficient classrooms, inadequate teachers, and hundreds of students crammed into few classrooms. Basic facilities like functioning toilets were often missing. I remember, and sometimes still practice, drinking minimal water to avoid using the toilets in these schools. Students frequently must go home to use the toilet, a sad reality they are forced to endure. Why should they have to do this? Why can't they have a

Current School Entrance



good functioning toilet? Why can't they study comfortably in decent classrooms with good benches, clean walls, and a neat whiteboard? Is it because they come from economically weaker sections? Or is it because the government isn't interested in upgrading the standards of its schools? Why are these students denied their basic rights?

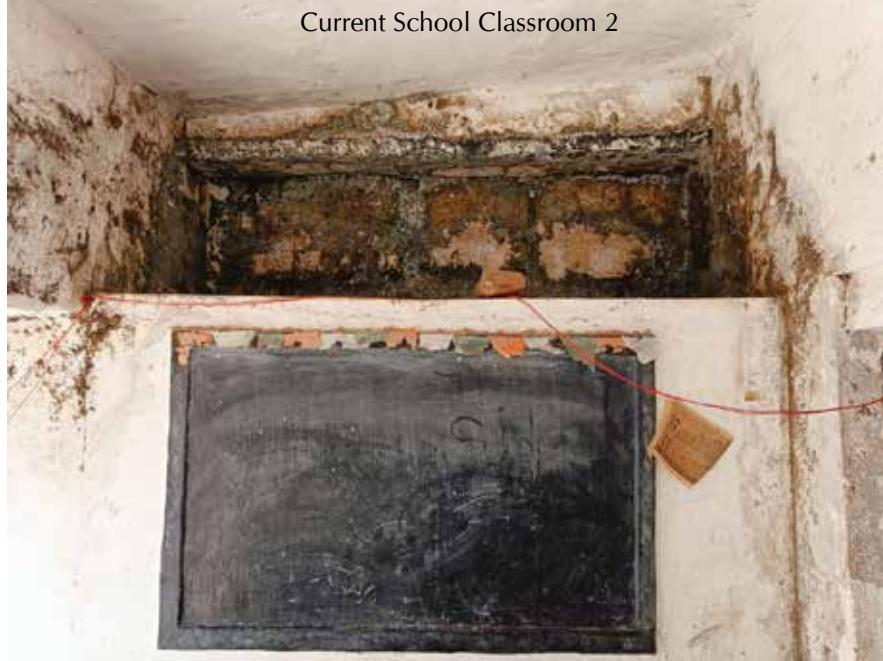
One recent experience stands out. I always felt bad about the condition of government schools but did not know how to solve the problem. Principals often talked about infrastructure issues and I was aware these required a significant amount of money. I finally decided to see if there was anything I could do. I knew I was aiming high, but I decided to give it a try. There was always a 50-50 chance I could succeed, and that possibility kept me going.

I researched on how to rebuild a government school. The more I read, the more disheartened I felt. According to a UNESCO report, there are around 1.5 million schools in India, with the majority being government-run. Many of these schools are in poor condition. In Agra, for instance, 70-80% of government school buildings are dilapidated, posing serious risks to students' safety. These statistics gave me sleepless nights but also ignited a fire within me. I had to do something, even if it was just a drop in the ocean.

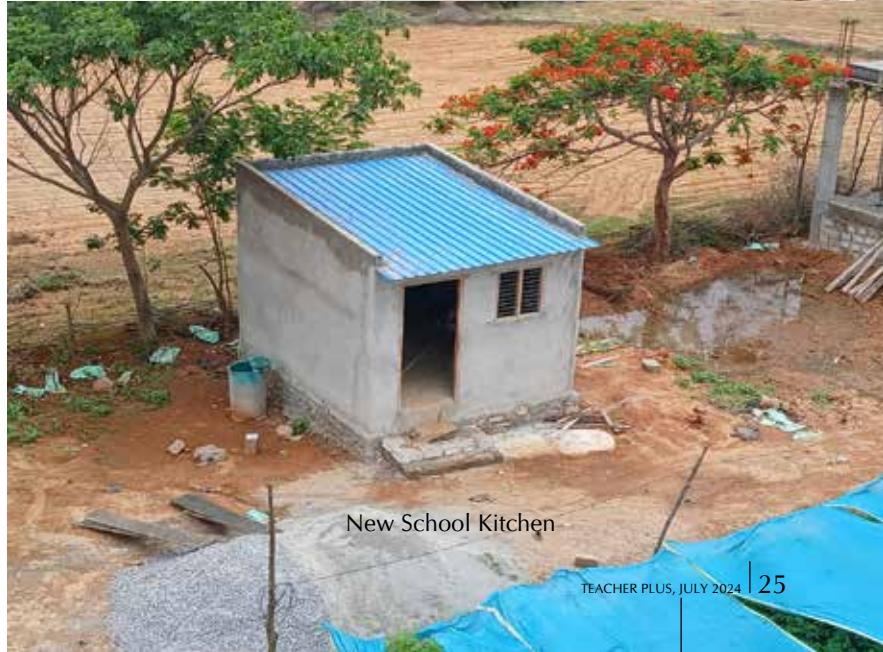
I started reaching out to various organizations for support. Most turned me down, and some listened but ultimately declined because they couldn't support an individual. I regretted not having a registered NGO. Every door seemed shut, it seemed like I was endlessly waiting for an opportunity. One morning, I received a message from a teacher at a government school with whom I had previously worked. The teacher sent pictures showing that Round Table India (an organization that works to bring about change in the community) had helped build two new classrooms. This was the lead I was looking for.



Current School Classroom Entrance



Current School Classroom 2



New School Kitchen

*<https://www.roundtableindia.org/>



I gathered information about Round Table India and tried to contact them. After a while, they responded and agreed to visit the school I was hoping to rebuild. I explained the situation, and after seeing it, they agreed to work on the project. It was a joyous moment, but the pandemic hit, putting everything on hold. Corporates redirected their CSR funds to support employees, and I got too busy with my life. The project got stalled, but I was keen to finish what I started.

After a year or so, I reached out to Round Table India again. They were willing to resume but needed financial backing. They asked me if I could find a sponsor. Despite previous experiences of rejections, I agreed. I went back, researched, and reached out to people but nothing worked. I reached out to some of my friends in the social sector to see if anyone could help. They shared a few contacts and I spoke to them as well. They said they would help but never got back.

Finally, one of the corporates showed interest. After exchanging a few emails, they gave the green light and said they would sponsor the project partially. Meanwhile, Round Table India came up with another sponsor and finally we were ready with the budget we needed. The project kickstarted in April this year and is expected to be ready by June. By the time this article is published, there will be a new school building that accommodates 200 odd students.

What I am doing is just a drop in the ocean, but it brings me immense happiness and pushes me forward in my journey. If you know of a school that needs similar support, feel free to reach out to me.

Financial background should not hinder access to quality education, which is a fundamental right.

Working on this project taught me that while the challenges are immense, the satisfaction of making a difference, no matter how small, is invaluable. As I continue my journey, I hope to inspire others to act and contribute in their own ways. Whether it's through volunteering, donating, or simply spreading awareness, every effort counts.

Reflecting on the conditions of government schools, it's evident that investing in education requires dedication, resources, and a collective will to make a difference. It's about recognizing the value of education and committing to creating spaces where children can learn without fear, without having to compromise on their dignity and safety. It's about building a future where every child, regardless of their socio-economic background, has the chance to succeed.

This journey, although challenging, has shown me the power of perseverance and the impact one can make. I invite you to join me in this mission. Together, we can rebuild, restore, and renew the essence of education in government schools, ensuring that they too become places where dreams are nurtured, and futures are built.

The author has moved on from working as a senior system architect to a passionate advocate for educational and social initiatives. Today, she wholeheartedly engages with low-income private schools and government institutions, championing equitable education and community development. She can be reached at sushmita.aripirala@gmail.com.

THE LIFELONG LEARNER: EMBRACING CHANGE

THINGS WILL NEVER STAY THE SAME



THE WORLD IS CONSTANTLY EVOLVING



IT CAN BE HARD TO EMBRACE CHANGE



AND SAY GOODBYE TO WHAT'S FAMILIAR



BUT WHILE YOU WILL MISS HOW IT WAS



YOU MIGHT LOVE HOW IT'S GOING TO BE



Letter writing to elicit expression

Mrinmayi Vaishampayan

Festivals call for some very colourful and engaging days at school too! September comes with Ganesh festival, celebrated primarily in Maharashtra, followed by a chain of festivals like Navaratri, Durga Puja, and Diwali. Schools are filled with a range of cultural events and celebrations during these days. Involving children in different activities during this time can be looked at as a very meaningful design of educational experiences.

In our school, festivals come with a series of dynamic activities that stimulate students' diverse faculties. Instead of long vacations students enjoy school days participating in varied cultural programs performed by the best in the field. There are also creative activities where they can express themselves through different media, be it writing, performing, talking, or even creating.

This year we had letter writing as one of the self-expression activities. We asked the children to write letters on two subjects. These subjects were intentionally kept generic and open-ended to give the children freedom of choice.

1. ...and I was appreciated!
2. Now that I think, I can see I was at fault...

Little did we teachers know that this activity was going to unfold multiple layers of children's socio-emotional lives. We were surprised by the range of situations the children wrote about and expressed themselves truthfully without any hesitation or fear of judgments. Letter writing proved to be the most subtle and effortless way to help children express. We got glimpses of what goes on in the minds of our students, and the many important insights about their lives beyond school.

With the overwhelming letters where children wrote about their fears, regrets, hurt, grudges, joys, and overall emotional needs, we decided to do a basic analysis of themes which came up from the writing. We tried to analyze the contents of the letters based on the age, gender, and experiences. Here is what we came across.

The task – The children wrote these letters in the given time at the school. No specific instructions were given about the language, writing styles, or whom they should write the letter to, etc. Everything was left to them except the subjects. No one was forced to submit the letter upon the end of the given time.

The sample – The children who wrote the letters came from middle class, urban, mostly nuclear families.

The themes which arose from these letters range from everyday but intense matters to occasions where



they did not get a good chance to express themselves. The occasions they wrote about included fights with family members, the care and attention they miss from parents, lack of communication in the families, strained relationships, social situations where they helped strangers, somewhere a stranger had an impression on them, situations where they felt extremely lonely, got over their own weakness or limitation, grieved, realized their mistake, and felt guilty.

Adolescence is an age when you are always on an emotional roller-coaster. It is not easy to express how you are feeling and the whys and whats of it. Children in this age prefer keeping their intense emotions to themselves and often take a lot of time to build trust in a person to talk about their difficult emotions in the school setup.

Letter writing served as a subtle and easy way to express the intricacies of their socio-emotional experiences. Students might have felt emotionally safer because of the open nature of this form of writing. Moreover the judgement-free structure of the activity might have boosted their confidence. The idea of putting out pent-up emotions with the underlying assurance that no one is going to poke them about it later, might have helped children express more freely.

Many times, we as teachers would like to know about the family background, interactions, relationships, etc., of our students in order to know them better. Students might not feel very comfortable if we formally inquire about these things. To decode student behaviour in school, all these experiences of the students can give some crucial cues to teachers to decide their action plans.

Once we realized that letters helped students to express themselves better, to reveal their vulnerability, we took conscious efforts to process the letters further, where we found some serious emotional turmoil through the letter. The class teachers had a one-on-one chat with the student. In a lot of cases, we also tried to address the matters more subtly without bringing up the reference of the letter. This helped keep the trust of the children intact.

Semi-structured letter writing exercise could be a powerful tool to elicit information from the socio-emotional realms of adolescents. Further processing of the data elicited from the letters plays a crucial role in building stronger teacher-student relationships.

Our school learnt this in retrospect. We hope all other teachers will make a conscious use of this technique.

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Maryam

The mathematician

Mamata Pandya

I have written about women in different time periods, who have struggled, against all odds, to break glass ceilings in numerous fields. Their stories continue to inspire and move us even today. This is a contemporary story of a young woman who scaled new heights in mathematics, in a short life.

Maryam Mirzakhani was born in Tehran, Iran, on 12 May 1977. Her father was an electrical engineer. She grew up with three siblings. Her parents were always supportive of their children and encouraged them to work towards something that would be meaningful and satisfying to them, rather than for what society would consider success and achievement. The 1980s were difficult years for growing up in Iran on account of the Iran-Iraq war. But Maryam was secure in the love of her family. She loved to read, wanted to become a writer and would make up stories. Science was not her first love; it was her older brother who gradually awakened the spark when he used to tell her what he had learnt at school.

The war ended around the time that Maryam finished elementary school. She joined the Farzanegan Middle School in Tehran where she met Roya Beheshti, who became her close friend. The two shared an interest in reading and used to spend a lot of time going to bookstores and buying books. Their school, administered by Iran's National Organization for Development of Exceptional Talents, aimed to educate the brightest pupils. The principal and teachers of the school were keen that their students should get the same opportunities as would students in a boys' school.

Maryam did not do well in mathematics in her first year at Farzanegan. Her teacher told her that she was not particularly talented in that subject and Maryam lost interest and confidence in mathematics. However, in her second year she had a different mathematics teacher who encouraged her. This led Maryam and Roya to excitedly engage with mathematics.

When the two friends progressed to high school, they found a copy with six mathematical olympiad problems and Maryam managed to solve three of them. Encouraged by this, the girls asked their school principal if she could arrange for them to have mathematical problem-solving classes, as boys' schools had for talented students. The principal was supportive and arranged classes for the girls. Later Maryam recalled that this positive mindset was a great influence in her life.

Both Maryam and Roya made to the Iranian Mathematical Olympiad team in 1994 – the first girls to do so. The competition that year was held in Hong Kong and Maryam was awarded a gold medal, while Roya bagged the silver. The next year, Maryam, still in high school, became a member of the Iranian Mathematical Olympiad team, and was once again awarded a gold medal.



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In 1995 Maryam joined the Sharif University of Technology in Tehran to study mathematics. She enjoyed the problem-solving sessions and informal reading groups, and also the support and friendship of many professors and students who inspired her, and shared her growing excitement with mathematics. She published several papers while pursuing her graduation. After obtaining her degree from the Sharif University in 1999, Mirzakhani left for the United States to join graduate school at Harvard University. She earned a Ph.D. from Harvard University in 2004 for her 130-page thesis *Simple Geodesics on Hyperbolic Surfaces and Volume of the Moduli Space of Curves*.

In 2004 she was offered a junior fellowship at Harvard, but turned down the offer. In the same year she was awarded a Clay Research Fellowship and was appointed as an Assistant Professor of Mathematics at Princeton University. This was a great opportunity for her. As she recalled: *The Clay Fellowship gave me the freedom to think about harder problems, travel freely, and talk to other mathematicians. I am a slow thinker, and have to spend a lot of time before I can clean up my ideas and make progress. So I really appreciate that I didn't have to write up my work in a rush.*

The fellowship gave her the time to produce some brilliant papers. After completion of her research fellowship in 2008, Maryam moved to Stanford University where she was appointed as Professor of Mathematics in 2009. She was then 31. Maryam married Jan Vondrak, a computer scientist whom she met while at Princeton. He also joined the faculty at Stanford in 2016. Their daughter Anahita was born in 2011. Maryam would spend hours at home with large sheets of paper sketching out ideas, diagrams, and formulae; her young daughter would remark, "Mummy is painting again!"

When once asked what was the most rewarding part of her work, Maryam had responded: *Of course, the most rewarding part is the "Aha" moment, the excitement of discovery and enjoyment of understanding something new, the feeling of being on top of a hill, and having a clear view. But most of the time, doing mathematics for me is like being on a long hike with no trail and no end in sight! I find discussing mathematics with colleagues of different backgrounds one of the most productive ways of making progress.*

Maryam's work soon led to her receiving recognition and awards. The most significant was the Fields Medal that Maryam was awarded in 2014.

The Fields Medal, established in 1936, is often described as the Nobel Prize of mathematics. But unlike the Nobel Prizes, the Fields Medals are given only to people aged 40 or younger, not just to honour their accomplishments but also to predict future mathematical triumphs.

Maryam was the first woman and the first Iranian to win this prize. It was presented to her at the International Congress of Mathematics, held in Seoul, South Korea on 13th August 2014. The award recognized Maryam's "outstanding contributions to the fields of geometry and dynamical systems, particularly in understanding the symmetry of curved surfaces, such as spheres, the surfaces of doughnuts and of hyperbolic objects".

Even before she got this award, Maryam had been diagnosed with breast cancer. She continued her work, producing not only results of great significance but developing tools that would be used by other researchers in the field. The cancer spread to her liver and bones and she passed away in July 2017. Her death robbed mathematics of one of its brightest stars who, at the age of 40, was at the peak of her craft.

The little girl who loved to read and imagine, reached unimagined peaks in a subject that did not initially excite her. As she once said about the pursuit of mathematics: *I don't think that everyone should become a mathematician, but I do believe that many students don't give mathematics a real chance. I did poorly in math for a couple of years in middle school; I was just not interested in thinking about it. I can see that without being excited, mathematics can look pointless and cold. The beauty of mathematics only shows itself to more patient followers.*

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Fascinating fungi-facts

Nandini Dholepat

When I took out my cell phone, I noticed missed calls from Sujatha, and a message asking, "What is this?" with a photo of a branch.

In the photo I could notice someone holding a piece of a tree branch. I asked her to bring it home, so that we could talk more. The following evening, both Sujatha and her daughter Rini came to my house with the branch.

Sujatha said, "Rini brought this from somewhere. I found it unpleasant and asked her to throw it out. She is not willing. She says she wants to show it to you first before throwing it away. As you were out of station, I had to wait for you."

"This is a dead tree branch. The small white growth on the branch are mushrooms. They are fungi," I replied.

"Oh my god, that is bad. Last rainy season there was too much dampness in our house. A bathroom wall was completely covered with black fungal growth. I developed sneezing and allergy because of it. Does this also cause infection?" Sujatha frowned.

"Not to worry, Sujatha. Fungi are part of nature. These mushrooms help to breakdown dead matter," I replied.

"Where did you find this Rini?" I asked.

Rini replied, "Aunty, you know there is a narrow stream behind our society and some trees on the other side, I picked it up from there."

"This girl goes anywhere. I am worried. There may be snakes also," Sujatha closed her eyes tight shut.

"Rini, keep the branch in the corner in the balcony. I will get you something to drink." I made them sit on the sofa and moved towards the kitchen.

I served fruit juice and placed a container in front of them. "See, you are familiar with these mushrooms we use for cooking."

"I know these are oyster mushrooms. Rini's father likes them. He says they are rich in proteins, but my parents do not eat them," Sujatha said.

"Yes, generally older people hesitate to eat them as they grow on dead and decaying matter. What we buy commercially are cultivated on hay though and mushrooms are commonly used with other vegetables nowadays," I replied.

"How to know which fungi are good and which bad?" Rini asked.

"The yeast granules which we add while baking bread are fungi. Penicillin, which is given as medicine, is also derived from fungi. So not to worry about that now. Next week we will go near the stream and try to find out more. You can also invite your friends to join," I suggested.

Images courtesy: Nandini Dholepat



Mushroom on floor



Lichen on rock

"That will be great! I will invite Anand, Vivan, and Shilpa too. Amma we will all go with aunty," Rini said excitedly.

"Sure, next Saturday morning we all will go there. We all wear long sleeved shirts or t-shirts, pants, and shoes. It is a marshy area and will have mosquitoes," Sujatha cautioned.

"Get some carry bags, scalpel, or scissors, in case you need to collect something," I added.

Saturday morning, we all walked towards the stream. As we crossed our society compound, the grass welcomed us. "See these small white umbrellas? We call them 'nayikode' or dog's umbrella." Anand pointed towards the mushrooms on the floor, "Ha, ha, ha... dog's umbrella, so funny." All the children laughed.

"Can we touch them?" Vivan asked.

"Sure dear, but they are very fragile, they will easily tear off," I replied.

When we reached the bushes, Rini showed us the place from where she collected the dead branch. Vivan pointed towards a huge fallen log. He almost shouted, "Oh! See there are so many design plates on the log."

I tried to explain, "Living trees collect many materials from the environment like energy from the sun, water, and minerals from the soil. All these will help to produce, timber, leaves, flower, and fruits. When it becomes old and dies, the important process of returning nutrients back to the environment begins. We can see a succession of life over the dead wood. First come the fungi, then mosses, lichens, termites, and many other life forms. Decomposing wood creates rich humus soil, for the germination of fallen seeds on the forest floor and begin the cycle once more."



"Are fungi plants? Do they produce leaves and flowers?" Rini asked.

"They belong to a different group. They do not synthesize their own food like plants or feed on other things like animals. Mushrooms which you see here are fruiting bodies."

I uprooted a few mushrooms and kept them on a piece of paper. "Look under this umbrella like structure, you can see many cross walls which are called gills. From here spore spreads, which later germinates to form filaments called 'hyphae.' At the base of the stem, they have a thin network of filaments called 'mycelia,' which collect water and



Polyporus on wood



Branch



Oyster mushroom

nutrients to nourish the fungus," I tried to simplify the description.

"How do they get nutrients from dead wood aunty? These mushrooms are turning black. Are they dying?" Vivan asked.

"The mycelia release some chemicals called enzymes, which help breakdown the dead wood and get the nutrients. The lifespan of these sporulating bodies is very short like one or two days," I replied.

"O..ho! we cannot take it home and grow. But how do we get mushrooms in the market?" Vivan asked.

"Those are commercially cultivated on a large scale. It requires a special setup. Farmers regularly harvest, pack, and supply it to market. Is it not Nandini? Madhavi asked.

Sujatha cautioned everyone. "It is slippery here, step carefully to cross the stream. The green thing on the stones, is making it slippery."

"What is this green growth? Why it is slippery?" Rini asked.

"It is algal growth. They are a kind of small plant, which grow in moist places. They secrete mucilage on the surface. The slimy surface is slippery," I replied.

"See this, green and white hair like. Looks something different, what are these?" Vivan showed another tree branch.

"These are lichens. Algae and fungi living together. The relationship is symbiotic. The algae synthesize food and fungi provide nutrition and substratum for algae to grow," I replied.

"This is interesting. I can see small flower like patches and in some places, it is growing like threads."

"Here you can see two different forms of lichens: 'Fruticose' with hairy branches and 'Foliose' is leaf like. They are very sensitive to atmospheric pollution, as they are directly exposed to air. In less polluted areas, like land away from industries and townships, you may come across a lot of lichen growth. They are considered indicators of pollution levels. Look here, it is growing on the rock too," I showed them white growth on a rock.

"Oh! this is interesting. My grandmother keeps something like this in our kitchen and calls this 'Kallu huvu' or stone flowers," Anand added.

"Yes, Anand. Traditionally, it is used to prepare some food and medicines also. The weather is cloudy, it may rain now. I hope you have collected interesting materials in your bags," I said.

"Yes, we should return now. Nandini, how to learn more about these fungi and lichens?" Sujatha asked.

I said, "I will request my friend Prof. Reshma to spend some time with us. She works for the bioscience department at the university."

"Can we go to the university? I am ready. Please talk to your friend and confirm our visit. I would really love to go there and learn more." Sujatha was excited.

"Sure, I will try. Meanwhile, when you go home, keep the collected material in the open air, in your backyard or balcony and take pictures. Label them properly." Let's return now.

Suggested activities

1. Use your internet skills and try and name the fungi that grow in and around your neighbourhood.
2. Make a list of beneficial fungi.

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Fighting climate change by minimizing food waste

Subhadip Senapati and Narayan Barman

Climate catastrophe is not a dystopic calamity from the future anymore, it is already upon us. There are some compelling and undeniable shreds of evidence for climate change seen throughout the world – the rise of average surface temperature, the rise of sea level, melting glaciers, and extreme and unusual events to mention a few.¹ India is also experiencing the wrath of climate change. The unusually warm weather, a decrease in seasonal rainfall, frequent depressions and cyclones point in that direction.² India, a country with an almost 1.4 billion population, rich with natural resources, must find ways to combat climate change to save its citizens and preserve its abundant natural resources. For us to be successful in this endeavour, we must understand the reasons behind climate change and act on it. One of the most underappreciated, yet significant causes of climate change is food waste. Almost 1/3rd of the food (vegetables, fruits, dairy, meats, etc.) being produced globally is wasted every year. Rotten food emits greenhouse gases and accounts for almost 8-10% of the total greenhouse emissions, leading to global warming and climate change.³ If food waste were a country, it would rank third in total greenhouse gas emission after China and the USA, followed by India and Russia (Figure 1).⁴ About 1.8 billion tons of food is wasted worldwide every year and the resources needed to produce the food that is wasted/lost have a carbon footprint of 3.3 billion tons of CO₂.⁴

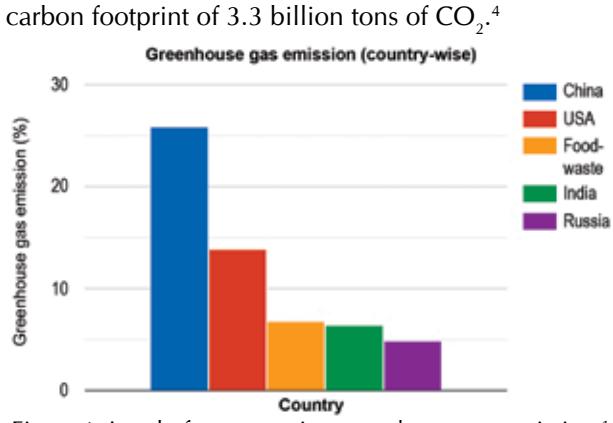


Figure 1. Level of country-wise green-house gas emission.¹

Up to 40% of the food produced in India is wasted. India wastes as much food as the United Kingdom consumes. The food waste per capita per year in India is 51 kgs.⁵ In a country, where millions go hungry daily, this is also a humanitarian issue and leads to a huge economic loss too. We all must take responsibility, individually and collectively, to minimize the food waste around us. To achieve this, we must spread awareness and educate kids and adults about how food waste contributes to climate change and how we can minimize it. The aim of this article is to:

- Spread awareness regarding climate change and how food waste is contributing to it.
- Educate students on the negative repercussions of food waste.
- Encourage people to minimize their food waste and plan for better waste management.

Correcting the course: educating young minds

To educate young kids and students about the long-term repercussions of food waste, the following steps can be undertaken. Students are extremely impressionable and they learn a lot just by observing their parents and teachers. Hence, educating the parents and teachers is critical to achieving the final goal.

- Awareness assessment:** The first step should be assessing the present awareness regarding climate change among the students and their parents. This can be followed by another survey to understand the extent of food wastage in their homes. Surveys can be conducted with students from both rural and urban backgrounds. The outcomes of these assessments will tell us how conscious the students (and, their parents) are on the topics of climate change, food waste, and the causal effects the latter has on the former. This data will act as the platform for the critical interventions required in the next step.

2. Educating students and spreading awareness:

Students should be made aware of the implications of the climate crisis and how food waste is contributing to that (through presentations, online simulations, videos, and teacher-student interaction). There can be quizzes at regular intervals to monitor their progress. Their parents will also be made aware of the negative impact food waste has on climate change. This might drive them towards minimizing food waste at home, and lead by example for their kids. An extremely useful, open-source document provided by World Wildlife Fund (WWF) could be used for this purpose.⁶ A brief activity at school can be conducted to make students aware of the amount of food that gets wasted in schools or homes.

2.1. Students' activity: Food-waste audit

- i) Before the students have lunch at school, give each student a waste container.
- ii) After their lunch, ask the students to put the remaining food and drink in the container (without box, bags, wrappers, etc.).
- iii) Students can weigh their individual food waste and note it down. Later, they can throw the wasted food into a large waste container.
- iv) Students can then weigh the total food waste and note it down. Alternatively, they can just add up the weights of individual waste and calculate the total waste.
- v) Once students realize how much total food they have wasted, conduct a discussion session with them. Ask the students if they can think of any potential problems associated with food waste.
- vi) The students can conduct the same activity at regular intervals. The data could tell us if the students are becoming aware of the relevant issues and minimizing their waste.

3. Fun engaging projects: Toolkits can be provided for students from different grades to perform a few activities at home or at school. Some of these activities can utilize food waste as fertilizers, to grow vegetables, formulate cleaning products, or make air fresheners, to name a few. A few activities have been proposed in this article. Teachers can modify these activities or come up with their own activities.

3.1. Growing vegetables from waste

- i) This activity can be performed using the unused base or root parts of several common vegetables, such as lettuce, green onions, onions, beetroot, etc., as these are easy to avail. But several other vegetable scraps can be used as an alternative.⁷

- ii) Students can take the unused parts of the vegetable (scraps) and partially submerge them in water in small glass jars. These could be the base of a lettuce, the white bottom part of the spring onion, top part of the beetroot, or onion with root. The onion and beetroot scraps should not be completely submerged to avoid rotting.
- iii) Keep the jars of water with the vegetable scraps under the sun for 5-7 days and add water to the jars to compensate for the water loss due to evaporation.
- iv) After a few days, roots / shoots / sprout (depending on the vegetables) will start to grow.
- v) After 7-10 days, plant them.
- vi) Vegetables will continue to grow, but may take different time to do so.
- vii) Different forms of food waste such as egg shells, used coffee grounds, used tea leaves can be added to the soil as sources of nutrients.

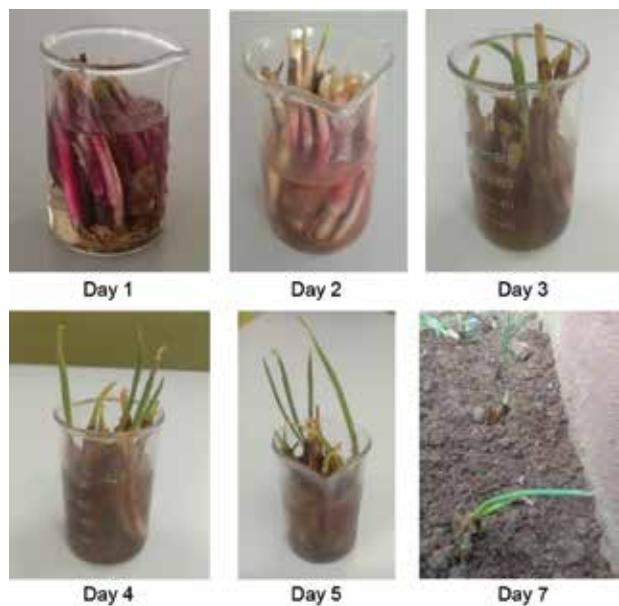


Figure 2. Regrowing fresh spring onion from its scraps

4. Creating reading material: For educational purposes, engaging study material(s) can be created. The content can be customized based on the students' levels and can focus on the already available chapters from the NCERT syllabus (i.e., 'Garbage in Garbage out', 'Waste Management', 'Pollution of Air and Water', 'World Climate and Climate Change', etc.).

5. Waste management: Finally, some other alternatives to utilize food waste at home (such as compost, animal food, biogas, and other creative

pathways) can be implemented as short-term projects.⁸⁻¹⁰ Creating biogas or electricity from food waste can be a little challenging in a school environment due to the nature of equipment or setups involved. However, if that is not an issue, students can participate in short-term projects to form biogas or electricity from food-waste. One simple activity based on composting has been proposed here (Figure 3).

5.1. Students' activity: Food-waste to compost

- i) Students can take a suitable container for producing the compost. It can be a compost bin, a bucket, empty paint container, terracotta pot, etc., and the volume can vary depending on the amount of waste. They should make a few holes on the walls, the lid and also at the bottom of the container to facilitate aerobic composting and drainage. Alternatively, plastic garbage bags can be used.
- ii) Fill the first layer with the 'brown' materials. This can be a mixture of soil, dry leaves, small pieces of newspaper, paper napkins, cocopeat, small cardboard pieces, etc.
- iii) The next layer is crucial. This is the 'green' layer, where students can use food scraps (vegetable and fruit wastes) from the kitchen and transfer them on top of the brown layer. Broken pieces of egg shells can be used as well.
- iv) Important: Do not use milk, meat, or cooked products as these can attract unwanted pests and can compromise the compost process.
- v) To facilitate the bacterial composting process, curd or yogurt can be added. This is an optional step that will make the process faster.
- vi) Next, students can add another layer of 'brown' material containing soil, dry leaves, etc. They should add enough water so that the mixture is moist.
- vii) Close the lid and keep the container aside for a week. After one week, students will see that the composting process has started. They can mix the layers well to facilitate aerobic decomposition.
- viii) After one month, the compost should be ready for use.

Potential impact

Young students are the future of any country and their awareness will bring positive change to the future of India. At the same time, increased appreciation for nature and climate could encourage adult citizens to act more responsibly. As an added advantage, both students and their parents will be



Figure 3. Different layers of waste that will form compost material from food-waste

able to learn from each other in a symbiotic way. By minimizing food waste, we will be able to curb greenhouse gas emissions by up to 8-10%, which is bound to leave a positive footprint in our fight against the climate crisis.¹¹ We must realize that wasting food not only has humanitarian and economic repercussions but also environmental ones and it is high time that we acted on it.

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Bringing the OUTSIDE inside the classroom

Timira



Image created by Divya Choudary using AI.

In 2018, section 377 of the Indian Penal Code was ruled unconstitutional by the Supreme Court, effectively decriminalizing homosexuality in India. Several newspapers carried full-length front-page images of same sex individuals in tight hugs and locked lips. We decided to put up one such front-page image on our school bulletin board with a little sign that said, "Have a question about this? Ask an adult closest to you!" Teachers were nervous. But they knew they had been pushed into the deep end and had no choice but to learn to stay afloat.

By the time the children walked into school the next morning, teachers who never thought they would ever be required to have conversations about LGBTQ, equipped themselves to talk across age groups with a new vocabulary, the latest abbreviations and pronouns as well as children's picture books that addressed the idea of 'free love' in the simplest, most colourful ways! The conversations that occurred that day, inside classrooms, in corridors, in the lunch hall and on the

playground between teachers and students is what education should look like.

In this month's column, I'd like to address the importance of connecting learning to the world that exists outside our classrooms, the curiosities that exist within the minds of students and the dialogical relation this approach encourages between the teacher and the student.

For several years, education has followed what Paulo Freire, in his book *The Pedagogy of the Oppressed*, called the 'banking' concept of education. In this system, teachers have ownership of knowledge and act as "depositors" of this knowledge, with the primary role of "filling" students who are "empty containers". The more completely they fill the receptacle, the better teachers they are. The student records, memorizes, and repeats this content detached from reality, making it completely insignificant to them.

One can say that there has been a slight shift since, especially post pandemic, when educators across the globe realized that if it was content they were delivering, the internet did a better job. Thankfully, with 'social-emotional learning' becoming the new buzz word along with 'cross-curricular integration' and 'application-based learning', educators are now armed with new tools, techniques, and academic objectives that cover more ground than just memorizing content.

However, the relationship between the teacher and student still retains an imbalance of power, where the teacher holds pre-defined learning objectives (now more nuanced and layered than before) for their students as well as the sole authorship of the narrative in the classroom, leaving little room for the students to bring in their own curiosities of the world.

As someone who encourages educators to have conversations with children about 'difficult or hush-hush topics', I often get asked whether it is 'age-appropriate', a term that gives me immediate indigestion. Who decides what is appropriate for whom and when? This idea ties back into the banking notion of education where the educator's role is to regulate the way the world enters into the child's life, by making deposits of information which he or she considers to constitute true (and 'appropriate') knowledge.

This is why topics like war, violence, social justice, social and economic disparity, gender identity, politics, etc., stay out of the classroom, because adults think of them as 'inappropriate' even though children experience these issues in some form by simply co-existing in society as conscious beings.

In my limited but very experimental years of being in the classroom, I have experienced magic occur when academic objectives start growing tentacles and travel outside the classroom windows to rope the real world and its complexities in.

For instance, while studying about the Rann of Kutch in geography, we connected the importance of salt to Gandhi's *Dandi march* (see, cross-curricular integration!) and also created opportunity for students to be curious about the salt on their dining table. We brought in images of salt being made in salt pans and genuine dialogue began when questions and curiosities came from them. 'The workers don't look happy.' 'They look like they are from South India... apart from Rann of Kutch where else are there salt pans?' 'Where do the workers live?' 'How many hours do they work for in one day?' 'What do they earn for such hard work?' 'Where does the salt I eat come from?' We followed this up with an article published

by PARI (People's Archive of Rural India) that included interviews of the people who work there, and as the students read it, their questions were answered in the most authentic manner that could have been possible. Suddenly, students sitting in a suburb in Mumbai felt connected to salt makers in faraway Thoothukudi in Tamil Nadu.

Another example of dialogue that began a conversation was in a grade 8 English class while reading a story that had a reference to slavery. A student asked if slavery still existed, and the teacher immediately put a pause on the academic objective of the 'English' class and encouraged the discussion to see what the students thought modern-day slavery looked like. This led to the entire class opening up this topic and drawing parallels between slavery and caste-based occupations in India like conservancy work and garbage collection. We all create garbage. Someone clears it each day under exploitative circumstances. And yet, we don't speak about it.

Having dialogue in the classroom is what Freire calls the 'problem-posing education' model, which responds to the essence of consciousness of both the teacher and the student equally, in their relations with the world. It is the antidote to the banking concept.

He writes, "through dialogue, the teacher-of-the-students and the students-of-the-teacher cease to exist and a new term emerges: teacher-student and student-teacher. The teacher is no longer merely the one-who-teaches, but one who is himself taught in dialogue with the students, who while being taught, also teaches. They become jointly responsible for a process in which all grow. In this process, arguments based on 'authority' are no longer valid; in order to function, authority must be *on the side of freedom*, not *against it*. Here, no one teaches another, nor is anyone self-taught. People teach each other, mediated by the world, by the very 'cognizable' objects which in banking education are 'owned' by the teacher."

I love reading these words over and over again. It is reassuring to know that 'authority' can be seen as positive. In a democracy, authority is supposed to be on the side of freedom, not against it. People give governments authority so governments can give them freedom. Maybe, that's a conversation to start with students this month!

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PROJECT

Chocolate, anyone?

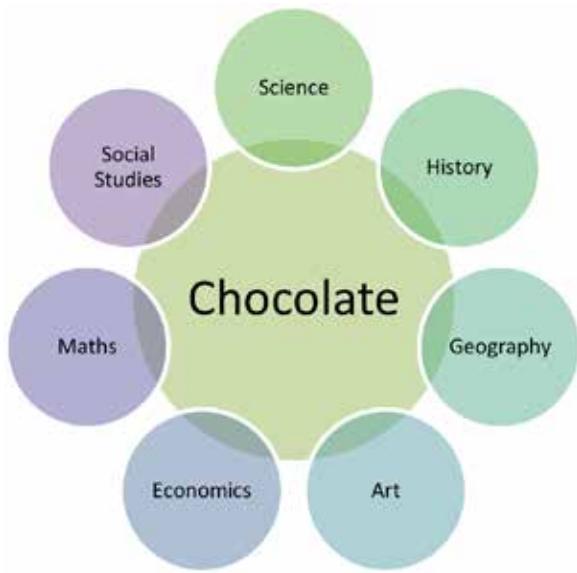
Sujata C

Who doesn't love chocolates? They are soft, creamy and smooth, bitter-sweet, melt in the mouth and leave one feeling so happy.

Why do we love chocolate? Research says four chemicals, which are related to reward and pleasure, are released by the brain when eating chocolate: endorphins, serotonin, dopamine, and oxytocin. Research also says that it is the way the fat in the outer layers of the chocolate melts in the mouth that adds to the satisfying experience. Xocolatl was a bittersweet thick, foamy beverage made by the ancient Mayans as part of their divine rituals. The word chocolate has its origins in this expression, as well as its special status from this "divine" connection. In its early days, chocolate was reserved for the elite and the upper class of the society.

Engaging school children in a project about chocolate can be a fun, easy, and mouth-watering experience, as it is, arguably, the most loved food around. This project can also provide an enriched learning experience because it connects various subjects including science, history, geography, math, social science, and art of course. The project is scalable and can be done with children of grades 3-12. Keep the project simple for younger children and scale up the complexity for children in higher

grades. It goes without saying, this project will make you the most popular teacher in school!



As is well-known, multidisciplinary learning gives perspective and knowledge, fosters a deeper understanding and encourages collaboration and critical thinking, which is necessary for addressing complex, real-world problems. A project on chocolate is also timely because the world is possibly running out of chocolate.



Here are some key considerations and steps to help you plan and execute a successful chocolate project.

Objectives and outcomes

Define the objectives and outcomes of the project and make a rough outline of how you will proceed.

- Understanding the history and origin of chocolate.
- Learning about the process of making chocolate.
- Exploring the geographical regions where the cacao bean is grown.
- Investigating the nutritional aspects and health impacts of chocolate.
- Understanding the economics of chocolate making related to chocolate production and sales.
- Career possibilities or hobbies that can emerge from the project.

You can begin the project by asking children how many types of chocolates they know and lead into introducing the three main types of chocolate: milk chocolate, dark chocolate, and white chocolate. Pass around small samples for students to see and taste. (It may be difficult for students to concentrate on the subject with their mouths salivating!). Discuss the differences in ingredients and flavour profiles.

History

Begin with the history of chocolate, tracing its origins to ancient civilizations; how the Mayans and Aztecs introduced it to Europe, and its evolution into the modern chocolate industry. You might want to highlight the fact that in the Mesoamerican civilizations, cacao beans were a prized possession and even used as currency. Show pictures of cacao pods and the beans inside them.

July 7 is celebrated as World Chocolate Day. Ask the children to find out why.

Geography

Equatorial Africa is considered the world capital of cacao beans. Now cacao is being grown in every tropical country. Use maps to show where cocoa is grown. Discuss the climatic and soil conditions necessary for cocoa cultivation.

Map work: Have your class make a map of cacao growing regions.

Find out where in India cacao is grown on a large scale. Which is the largest cacao producing country in the world and in Asia?

Belgian chocolates are considered the best in the world. Why?

Science

Botany: Study the cacao tree, its lifecycle, and how cacao beans are harvested. Prepare a poster on cacao plants, flowers, and fruits.





Do an experiment to find out the melting point of chocolate.

Chemistry: Explain the process of fermenting, drying, roasting, and grinding cacao beans to make cocoa butter and cocoa powder, the main ingredients in chocolate. Watch videos with your class that demonstrate these processes. Explain the use of cocoa butter in cosmetics for its skin hydrating quality.

Health: Discuss the nutritional content of chocolate and compare dark, milk, and white chocolate in terms of health benefits and drawbacks. Have students make a chart to show the benefits of various types of chocolates.

Excess consumption of chocolates can cause tooth decay because of the high sugar content in it. Find out the impact of chocolate on oral health.

Economics

The world is currently facing a shortage of cacao beans. El Nino weather conditions have led to pest infestations, which in turn has impacted crop yield. The war in West Asia is also not helping matters as ships are taking a longer route to avoid the war hazards in Red Sea. Find out how the global

chocolate supply chain works, from cocoa farms to chocolate manufacturers. Read about fair trade practices and the importance of ethical sourcing. Is over harvesting a factor in the current crisis? Find out.

Discuss the economics of chocolate production and sales. Introduce concepts like supply and demand, profit margins, and market competition.

Gather country-wise data related to chocolate consumption and sales trends and display on a chart or present in a report. This activity can be taken up in groups or teams.

Make a list of popular brands of chocolates available in the market. Ask the students to study the information on the wrappers and try to unpack the composition. How much chocolate is really in a basic milk chocolate bar (you can refer to one of the popular brands)?

Math: Calculate ratios for recipes, measure ingredients, and convert units.

Art: Encourage creativity by having students design their own chocolate bar packaging.

Draw chocolate-themed artwork – from beans to bars.

Study the wrappings of different brands of chocolates. Examine the common colours used. Why are colours like purple and gold popular with brands? Make a chart on fun facts of chocolate.

Language: Engage children in poem writing. Themes could include their love of chocolates, the taste and experience of eating a chocolate, chocolate fountain and so on.

If you want a simpler exercise, ask children to complete the sentence I love chocolate because.... Students can give multiple answers.

Discuss the etymology of the word 'chocoholic'.

Write a jingle or print advertisements for chocolates.

Culture: Chocolate is deeply embedded in modern culture. Due to the association of cacao beans with currency, the end product, chocolate, also came to symbolize wealth, luxury, and indulgence. Wherever there is a celebration, chocolates are sure to be going around. Find out why chocolate is used in celebrations.

There are places where chocolate is part of the cultural heritage. Many European countries like Switzerland, Netherlands, Belgium, and Germany have museums that preserve and display all things chocolate. Ooty is famous for homemade chocolates and has one such museum.

Chocolate sculpting is another way of celebrating the love of chocolates. It is an offshoot of cake art, and has many passionate followers.

Make a slideshow of famous chocolate artworks. Visit a chocolate museum if possible, or take a virtual tour, or watch videos.

Debate: Chocolate sculpting is a crime against chocolate.

What is the chocolate bunny and what is the history behind it. Find out.

Why is chocolate considered the best gift for all occasions?

Cookery: Conduct a cooking session where students can make simple homemade chocolate or try recipes like hot cocoa. Encourage creativity in recipes, e.g., almond-centered chocolate, gulkand-centered chocolates. Alongside, discuss/suggest possibilities of making a career/hobby as a chocolatier. Chart out the study and career pathways to becoming one.



Field trips, farm visit, and guest speakers: If possible, arrange visits to local chocolate factories or invite guest speakers from the chocolate industry to share their experiences and knowledge. If your school happens to be near a cacao farm, a visit would be worth it.

Quiz: Conduct a quiz on chocolates.

Exhibition: Organize a chocolate-themed exhibition where students can display their work, present their findings and possibly sell their homemade chocolate creations to raise funds for a related cause.

Have the class watch the films *Charlie and the Chocolate Factory* (2005) and the older version (1971) *Willie Wonka and the Chocolate Factory*. Discuss the treatment of the story in the two films and rate them. Recommend Roald Dahl's 1964 novel *Charlie and the Chocolate Factory* (on which the films are based) for reading. Watch other age-appropriate chocolate themed films.

For your own record, create a project portfolio that includes research notes, experiment results, creative projects, and reflections on what students have learnt.

Hit that sweet spot of success

Use a mix of learning strategies to cater to different types of learners – visual, auditory, and kinaesthetic. Ensure inclusivity in the classroom. Make sure all students can participate, considering any allergies or dietary restrictions by providing alternatives or focusing on non-edible aspects of chocolate. By carefully planning and integrating diverse activities, this project can provide a rich, multidisciplinary learning experience that educates students about the fascinating world of chocolate and remains with them for a long time.

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An Indian Chocolate Story

the making of the Manam craft chocolate

a photo story by
Saranya Pavarala



After undergoing meticulous fermentation, drying and ageing at the Distinct Origins Cacao Fermentery in West Godavari, the aged beans are brought to the Manam karkhana in Banjara Hills for roasting. The roasted beans are then cracked open and separated from their husks.

①

②

The cacao nibs are milled between three rotating chilled cylinders, transforming them into a powdery form. They are then continuously ground in an idli grinder, This results in a thick mass known as chocolate liquor, consisting of cacao solids and cacao butter.





The semi-refined cacao is further refined in a ball mill which makes the chocolate smooth, giving it a velvety texture.

It is then conched, i.e. mixed, agitated, and serrated overnight to ensure that each particle of cacao solid is suspended.

③

④

The chocolate is cooled and reheated to perfectly crystallise it into Beta V crystals either through the use of a tempering machine or by hand. The liquid chocolate is then spread into custom-made moulds.



Once the chocolate is solidified, it is taken out of the mould and packaged for sale.

Enhancing teachers' language proficiency and

Ravinarayan Chakrakodi



The Regional Institute of English South India (RIESI) collaborated with the Department of State Educational Research and Training (DSERT) and Samagra Shikshana, Karnataka, to design and implement a 15-day Professional Development Programme (PDP) for primary school teachers to improve their English language proficiency and pedagogical skills in order to enhance the quality of English language education in

government schools. This article presents the results and insights gained from the programme.

Methodology

The needs-assessment for the PDP was carried out using a questionnaire. A Google form with 23 questions was administered to teachers via WhatsApp. The responses provided valuable insights into the teachers' language proficiency levels,

English pedagogy



Photos courtesy: Ravinarayan Chakrakodi

specific challenges faced in teaching English, and expectations from the training programme.

Teachers expressed the difficulties they face while teaching English. The following difficulties were identified:

- Communicating with children in English
- Conducting engaging activities
- Teaching spoken English

- Teaching grammar
- Using English textbooks effectively
- Assessing students' performance
- Formulating simple sentences
- Constructing questions
- Teaching phonetic sounds
- Encouraging reading and writing in English in lower classes
- Managing diverse writing activities simultaneously
- Addressing mother tongue influence
- Capturing students' attention
- Encouraging English usage in rural areas
- Overcoming a lack of English exposure at home

An online writing task revealed that some teachers struggle with writing effective paragraphs. A few respondents wrote only two to three sentences instead of complete paragraphs, and even these shorter responses contained grammatical errors.

Self-assessment of language skills indicated that teachers generally rated themselves at the A2, B1, or B2 levels as per Common European Framework of Reference (CEFR) indicators. Teacher responses regarding teaching approaches and methods indicated that classrooms tend to be teacher-centered, with a focus on content over language skills. The predominant teaching method was explanation-based. It was, therefore, essential to provide training that encouraged more effective and student-centered classroom pedagogy.

This needs analysis provided valuable insights into the areas where teachers required professional development in English language education. The findings highlighted the importance of addressing specific language proficiency needs, improving pedagogical approaches, and tailoring training to meet teachers' expectations. Based on these insights, a comprehensive 15-day PDP was designed to empower teachers and enhance the quality of English language education in the state. The programme began in 2020-21 and continued in 2021-22 and 1023 teachers were trained during these two years.

The programme covered various aspects of English language teaching such as spoken English, vocabulary development in young learners, exploring reading, teaching grammar, developing writing skills, teaching young learners, learning outcomes and assessment, developing teachers' language proficiency and professional development.

In addition to the regular teaching sessions, the following activities were conducted during the PDP:

- Icebreaker on Day 1: to create a comfortable and interactive learning environment.
- Reflective reports: to encourage teachers to reflect on their teaching practices and identify areas for improvement.
- Presentations on various topics: to provide teachers with opportunities to present and improve their presentation skills.
- Story narration: to enhance teachers' storytelling abilities, which can be a valuable teaching tool.
- Big Books (larger version of a book prepared to share the story with the entire class): to introduce teachers to the concept of using big books in the classroom for effective teaching.
- Language games: to engage teachers in language-based games to promote interactive learning.
- Lesson plan preparation: to guide teachers in creating effective lesson plans for their classes.
- Question paper design: to familiarize teachers with the process of designing suitable and effective question papers.
- How to use 'Hello English' films/videos: to introduce teachers to language learning resources and tools.

- Film shows: to utilize films as a learning tool in the English language classroom.
- Book exhibition: to encourage teachers to explore English literature and educational resources.
- A demo on English *Nali-Kali**: to demonstrate innovative teaching methods for English language instruction.

Continuous assessment and feedback

The teachers' performance in story narration and language game presentations was assessed by the workshop faculty of RIESI. Constructive feedback was provided to help teachers improve their language use, presentation style, fluency, and confidence levels.

Online follow-up

A structured online follow-up of the PDP was conducted over three months. These follow-up sessions aimed at providing teachers with opportunities to implement the acquired knowledge and share their experiences with the faculty members and other teachers.

The follow-up sessions were designed to mentor and support teachers, encourage innovation in teaching

*[https://dsert.karnataka.gov.in/info-4/Nali + Kali/en](https://dsert.karnataka.gov.in/info-4/Nali+Kali/en)





practices, and enhance their English language fluency.

The following activities were conducted by the participants, who received the 15-day training, during the online follow-up sessions:

- i. Strategies to teach vocabulary with the help of teaching learning materials/worksheets/ dictionaries.
- ii. Activities to teach grammar (parts of speech, tenses, prepositions, articles, etc.).
- iii. Selecting news headlines and presenting them as a news report on AIR/TV channels.
- iv. Comparing the Karnataka state textbooks with NCERT textbooks or textbooks of other states/ private publishers, or with English *Nali-Kali* cards – classes 1 to 5 (what similarities/differences do you find in the selection of themes, activities designed, difficulty level of the language used, etc.).
- v. Using authentic materials and flash cards, teaching high frequency words, developing reading comprehension skills, using stories, other texts and media for developing reading habits.
- vi. Activities to teach spelling, punctuation, handwriting, sentence construction, writing short paragraphs, conversations, stories, personal letters, etc.
- vii. Teachers had to prepare video/audio recordings, worksheets or online activities for students based on the learning outcomes of any class.

viii. Preparing a question paper for a summative assessment based on the learning outcomes for any one class.

ix. Conducting an online training session.

Individual feedback was given to teachers based on their presentations. Constructive suggestions were given based on the following aspects:

- English language proficiency of teachers
- Ability to
 - design activities
 - use technology
 - make presentations online
 - demonstrate trainer skills

The follow-up sessions were uploaded on the RIESI You Tube channel and links were shared with teachers.

Link to YouTube recordings:

<https://youtube.com/playlist?list=PLsIZX9eAFjadGWVMPURZQuZqj4EegYaKz>

Google forms were used to collect teachers' reflective reports and feedback.

Feedback received

The feedback received from the teacher participants highlights the effectiveness and usefulness of the training program. Participants expressed their satisfaction with the training, stating that they

acquired valuable skills and knowledge to enhance their teaching practices. The positive feedback and success stories demonstrate the impact of the programme on the teachers' professional development.

The program improved their confidence in speaking English, enabled them to design effective activities, and encouraged the use of technology in the classroom.

Participant 1:

The training was very useful to me personally and professionally. I have learnt about vocabulary building activities, story narration, language games, lesson planning and I also learnt how to teach English to children using effective methods. It inspired me to pursue higher education in English. It also inspired me to become a wonderful teacher.

Participant 2:

It was an excellent training that I have ever received in my 13 years of service. I could learn spoken English as much as possible. I learnt many activities that will be beneficial to my students. All the faculty members used to encourage us to learn and speak in English.

Participant 3:

The follow up sessions were designed very well. Because of these follow up sessions, I am recalling the input I received during those 15 days and continuing to learn by exploring new ways. It's like having reinforcement sessions and a bridge between the training and the classroom teaching-learning process.

The online follow-up sessions proved to be beneficial in reinforcing the training inputs and allowed for continued professional growth. Teachers expressed appreciation for the guidance and opportunities to share experiences and innovative ideas with fellow participants.

Recommendations

Several recommendations can be offered based on the findings and experiences of the PDP and follow-up sessions. The suggestions include:

- Organizing experience-sharing workshops to encourage collaborative learning and professional development.
- Involving DIET Nodal Officers for English at the district level in supporting teachers in their further learning and career development.
- Offering extended training and professional development opportunities for teachers who need further improvement in their language and pedagogical skills.
- Conducting an impact study to gauge the effect of the training on student learning.

Conclusion

The PDP and the subsequent online follow-up sessions have proven to be effective in enhancing the English language proficiency and pedagogical skills of primary school teachers in Karnataka. The implementation of the recommended strategies and continuous support from educational authorities can further strengthen the impact of such programs and contribute to the overall improvement of English language education in the state.

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Maximizing assessment effectiveness

The significance of aligning question papers with Bloom's taxonomy

Charanjit Kaur Brar

Assessments play a pivotal role in evaluating students' knowledge, understanding, and critical thinking abilities. To ensure effective and comprehensive evaluation, educators must carefully design question papers that align with the desired learning outcomes. Bloom's taxonomy is a well-known framework for creating assessments; it provides a hierarchical structure for classifying educational goals and encouraging higher-order thinking abilities. This article examines the importance of framing exam questions in accordance with Bloom's taxonomy and how it affects improving students' learning outcomes.

Bloom's Taxonomy, developed by Benjamin Bloom, classifies learning objectives into six levels of cognitive complexity: remember, understand, apply, analyze, evaluate, and create^{[1], [2]}. With the higher levels requiring more complex thought processes, each level symbolizes a progression of cognitive abilities. Teachers can evaluate higher-order thinking abilities like critical analysis, problem-solving, and creativity by aligning assessment questions with these levels. These levels include not only factual recollection but also higher-order thinking capabilities. Integrating higher-order thinking into study habits is crucial as it fosters deep and

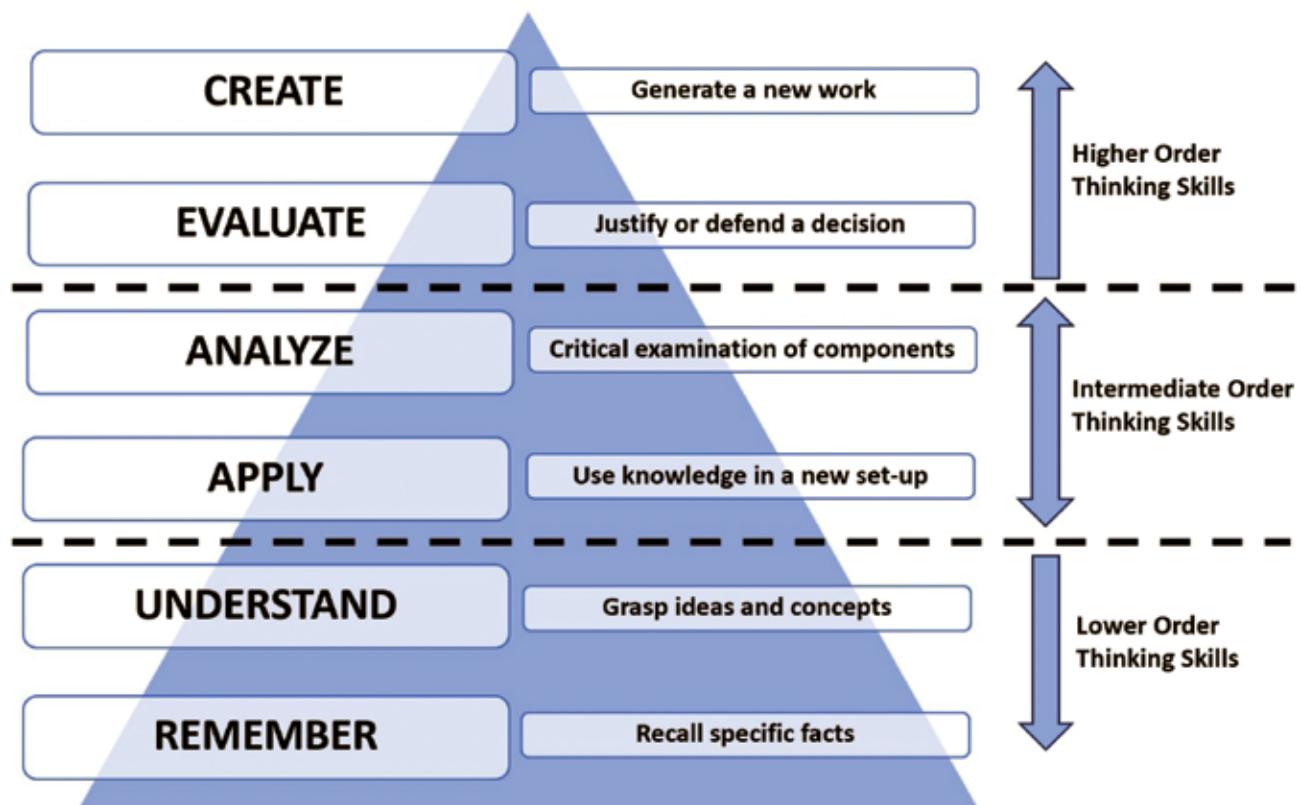


Figure: Bloom's taxonomy

meaningful learning in our brains, particularly in these advanced levels of cognition^[1]. The move from rote learning to practical and useful education aligns with Bloom's taxonomy by progressing students from the lower levels of remembering and understanding to the higher levels of applying, analyzing, evaluating, and creating. Practical education encourages learners to not only acquire knowledge but also apply it in meaningful ways, fostering critical thinking, problem-solving, creativity, and a deeper engagement with the subject matter. It's important to note that practical education doesn't dismiss the lower levels of Bloom's taxonomy, but rather integrates them as foundational elements that support higher-order cognitive skills. The Figure (on page 21) represents different levels of Bloom's taxonomy.

Questions that align with the different levels of Bloom's taxonomy are categorized as lower, intermediate, or higher-order questions^[3]. Lower-order questions primarily assess learners' knowledge and comprehension, testing their ability to recall and understand information at a basic level^[4]. Intermediate questions focus on the application and analysis of information, while higher-order questions encourage students to creatively synthesize and evaluate the significance of the information^[3]. While it may be necessary to pose lower-order questions at the beginning of a topic, it is crucial for teachers to shift towards higher-order questioning. This shift allows teachers to nurture the full potential of the students^[2].

1. Importance of framing question papers according to Bloom's taxonomy

By integrating the principles of Bloom's taxonomy into the design of question papers, educators not only assess the depth of understanding but also empower students to demonstrate higher-order thinking skills, ensuring a comprehensive evaluation that reflects the true essence of education. Some of the prominent benefits of aligning the evaluation questions with Bloom's taxonomy are discussed in this section.

Assessing higher-order thinking

Bloom's taxonomy enables educators to evaluate students' higher-order thinking skills^[5]. Analytical, evaluative, and creative abilities are crucial for success in both higher education and the workforce. Education professionals can assess their students' capacity to go beyond rote memorization and show a deeper mastery of the subject matter by creating questions that demand critical thinking and knowledge application.

Encouraging depth of knowledge

Students are prompted to engage with the subject matter at various cognitive levels using question paper designs that are based on Bloom's taxonomy. They are encouraged to learn more about the subject matter, put ideas into practice, and develop their own understanding. As a result, learning becomes more thorough and significant^[6].

Enhancing learning outcomes

When students encounter challenging questions aligned with higher levels of Bloom's taxonomy, they are motivated to develop advanced cognitive skills. By stimulating critical thinking and problem-solving abilities, these assessments foster intellectual growth, knowledge retention, and the ability to transfer knowledge to new situations. As a result, students develop a deeper understanding of the subject and achieve higher learning outcomes^[6].

Guiding instructional design

Framing question papers according to Bloom's taxonomy not only improves assessments but also improves instructional design. It helps educators align their teaching strategies with the desired learning outcomes, ensuring that the curriculum, learning activities, and assessments work in harmony to facilitate comprehensive understanding and skill development^[7].

Enabling learners to ask meaningful questions and provide constructive feedback

Bloom's taxonomy can be used as a tool to enable learners to delve deeper into the topics and ask better questions from teachers^[8]. By assessing the quality of students' queries across different cognitive levels, teachers can identify specific areas of strengths and weaknesses. This feedback serves as a guide for individualized instruction, allowing students to improve their knowledge gaps and refine their higher-order thinking skills.

2. Challenges arising from test questions that don't align with Bloom's taxonomy

When questions and evaluations are not aligned with Bloom's taxonomy, several disadvantages arise. This section explores the drawbacks of assessments that do not adhere to Bloom's taxonomy and emphasizes the importance of proper alignment for meaningful evaluation of students' knowledge and skills.

Limited assessment of higher-order thinking

Questions that do not align with Bloom's taxonomy often focus on lower-level cognitive skills, such as recalling facts and understanding basic concepts. This narrow scope of assessment fails to capture students' abilities in critical thinking, problem-solving, and analytical reasoning, thereby limiting the evaluation of their higher-order thinking skills.

Lack of challenge and engagement

Assessments that do not incorporate higher-level cognitive skills may fail to challenge and engage students. By neglecting the application, analysis, synthesis, and evaluation levels of Bloom's taxonomy, assessments may become monotonous, leading to disinterest and disengagement among students.

Failure to foster deeper understanding

When questions do not require students to apply their knowledge or analyze complex information, the assessment lacks depth and fails to foster a deeper understanding of the subject matter. This approach hinders students' ability to make connections, identify patterns, and develop critical insights.

Missed opportunities for skill development

Assessments that neglect higher-order cognitive skills can lead to students missing opportunities to develop and refine their critical thinking, analysis, and problem-solving abilities. By limiting the types of questions asked, students may not have the chance to practice and improve these crucial skills.

Inadequate preparation for real-world applications

Assessments misaligned with Bloom's taxonomy may not adequately prepare students for real-world applications of their knowledge and skills. By focusing solely on lower-level cognitive abilities, students may struggle to apply their knowledge in practical situations that demand higher-level thinking and problem-solving abilities.

Conclusion

Designing assessments that align with Bloom's taxonomy is crucial for fostering higher-order thinking skills and providing a comprehensive evaluation of students' knowledge and abilities. Such question papers offer a systematic and structured approach to assessment, aligning educational

objectives with the cognitive complexity of the questions. It empowers students to think critically, analyze information, and apply knowledge effectively. By putting this framework to use, educators can foster a deep understanding of the subject matter and promote the development of essential higher-order thinking skills. Assessments that deviate from Bloom's taxonomy not only fail to capture the full potential of students' capabilities but also miss the opportunities to foster deeper understanding, engagement, and real-world application. Overall, the assessments that are designed in alignment with Bloom's taxonomy contribute to meaningful and impactful learning experiences, preparing students for success in academia and beyond.

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Note: Look forward to a follow-up article on how to develop question papers based on Bloom's taxonomy in the August issue of *Teacher Plus*.

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THE OTHER SIDE

Have you heard of e-techno

Anuradha C

Last weekend, a very dear friend, from my college days, called to say that she was relocating within the city. Normally, this wouldn't be big news. But in her case, it was. She lives in a beautiful serene neighborhood in Bangalore. This itself sounds like an oxymoron! A house she owns, holds very dear, and has spent months over its personalized and tasteful décor. She wouldn't tire of admitting how much she loves the place.

Now, after merely four years, she announced that she was relocating, albeit with a very heavy heart. Why, I wanted to know. "I've put my son in that e-techno school I told you about. I have to live close by, otherwise it would be impossible for him to cope," she said. "But that e-techno school is just about 6 km away from your place anyway," I argued. "Forget 6 km, even if I live right next door, he wouldn't have an hour to spare. Such is the schedule. But they have a 92% strike rate on passing JEE!" she quipped. I had nothing more to say.

If you are wondering whether my friend is talking about one of those famed (or not so famed) IIT coaching centers, she is not. She is talking about a regular full-time school but with a "e-techno" focus. Still confused? Read on...

India's e-techno schools are emerging as significant players in the education sector in urban centers, focusing particularly on STEM education. These institutions aim to integrate technology into traditional teaching methods to prepare students for the evolving demands of the global workforce. High school, junior college, academic centers of excellence, coaching centers, industry partnerships, online learning apps – these schools morph into various avatars depending on how early a child wants to begin the pursuit, with an option to start as early as the 6th standard!

Schools reinventing themselves to suit the times is a desirable trend which is indeed praiseworthy and need of the hour too. However, the definition



schools?

of success in these schools becomes too narrow and skewed towards limited, short-term goals. That is a matter of grave concern. Let's play the devil's advocate and figure out what works and what doesn't for these e-techno schools.

Advantages and opportunities

1) Enhanced learning through technology

Interactive learning: E-techno schools utilize digital tools and platforms, such as smart classrooms, educational software, and other online resources to make learning more interactive and engaging.

Access to resources: Students have access to a wealth of online resources, including e-books, educational videos, and simulation tools, which can enrich their understanding of complex STEM subjects.

2) Focus on STEM education

Curriculum design: These schools often have a curriculum specifically designed to emphasize on STEM education. It includes integrating practical experiments, coding, robotics, and other hands-on activities that promote critical thinking and problem-solving skills.

Career readiness: By focusing on the STEM subjects, e-techno schools aim to equip students with the skills required for future careers in technology and engineering fields, which are in high demand globally. They help students succeed in JEE, NEET, and other coveted entrance examinations.

3) Personalized learning

Adaptive learning technologies: Many e-techno schools use adaptive learning technologies that tailor educational content to the individual needs of students, allowing them to progress at their own pace and ensuring a better grasp of the STEM concepts.

Regular assessments: Continuous assessment tools help teachers identify areas where students might be struggling and provide targeted support to improve their understanding and performance.

Challenges and criticisms

1) Accessibility and equity

Digital divide: Despite the advantages, there is a significant digital divide in India. Not all students have equal access to the internet and digital devices, particularly in rural and underprivileged areas. This can lead to disparities in educational outcomes.

Cost factor: E-techno schools often charge higher fees compared to conventional schools, making them less accessible for lower-income families.

2) Overemphasis on technology

Screen time concerns: Excessive use of digital devices can lead to increased screen time, which is associated with health issues such as eye strain, poor posture, and decreased physical activity among students.

Limited personality development: The focus on technology may also reduce face-to-face interaction, which is crucial for the development of social and communication skills. Sports, language, history, arts – they all take a backseat as the child is conditioned to think of these subjects as 'overheads'!

Reliance on technology: Over-reliance on technology can sometimes undermine traditional teaching methods that are essential for a well-rounded education. Balancing tech-based learning with conventional pedagogies is crucial.

3) Quality of education

Teacher training: Effective integration of technology in education requires well-trained teachers. There is often a gap in the training provided to teachers in e-techno schools, which can affect the quality of instruction.

The way forward

E-techno schools have the potential to revolutionize STEM education in India by providing students with the skills and knowledge needed for the future. However, for these benefits to be realized across the board, it is essential to address the challenges they face. Ensuring equitable access to technology, investing in teacher training, and maintaining a balanced approach to technology use in classrooms are key steps that need to be taken.

While e-techno schools offer innovative solutions and significant advantages in the realm of STEM education, a careful and inclusive approach is necessary to ensure that all students can benefit from these advancements. By addressing the existing challenges, e-techno schools can play a pivotal role in shaping the future of education in India.

In the meantime, I've offered to help my friend with her move. From a spacious three-bedroom house, she is moving into a tiny two-bedroom apartment right opposite the famed e-techno school, and wondering how to fit her 55-inch TV into the tiny new place, among other things!

The author is an IT industry drop-out after several years of slogging and money-making. She is now working freelance as a corporate technical trainer and content writer. She is hoping to channelize her passion for writing into a satisfying experience for herself and a joyous experience for her readers. She can be reached at <anuradhap@gmail.com>.

Touch

Arti Pandey, Anshumalika Rai,

The book

This book talks to an age group that is younger – preschoolers. It focuses on touch, privacy, and safety.

The text is well thought of and sensitively written. Two pages, towards the end, have notes for parents and teachers. Simplicity and barenness are the strengths of the book. Only what is necessary finds a place here.

A sample conversation:

Mother: Did you know some body parts are private?

Son: Private?

Mother: Private means just for you. These are your mouth and all parts covered by your under clothes.

Illustrations are simple and succinct - homes and clothes depicted are identifiable for readers in India. We found the one where the parents are getting the children to wash and clean especially cute. Also, on each page, both the boy and girl, as also the mother and father, are depicted – this is a book about each of us!

The questions it raises

Parents, here, talk with children in a straightforward manner.

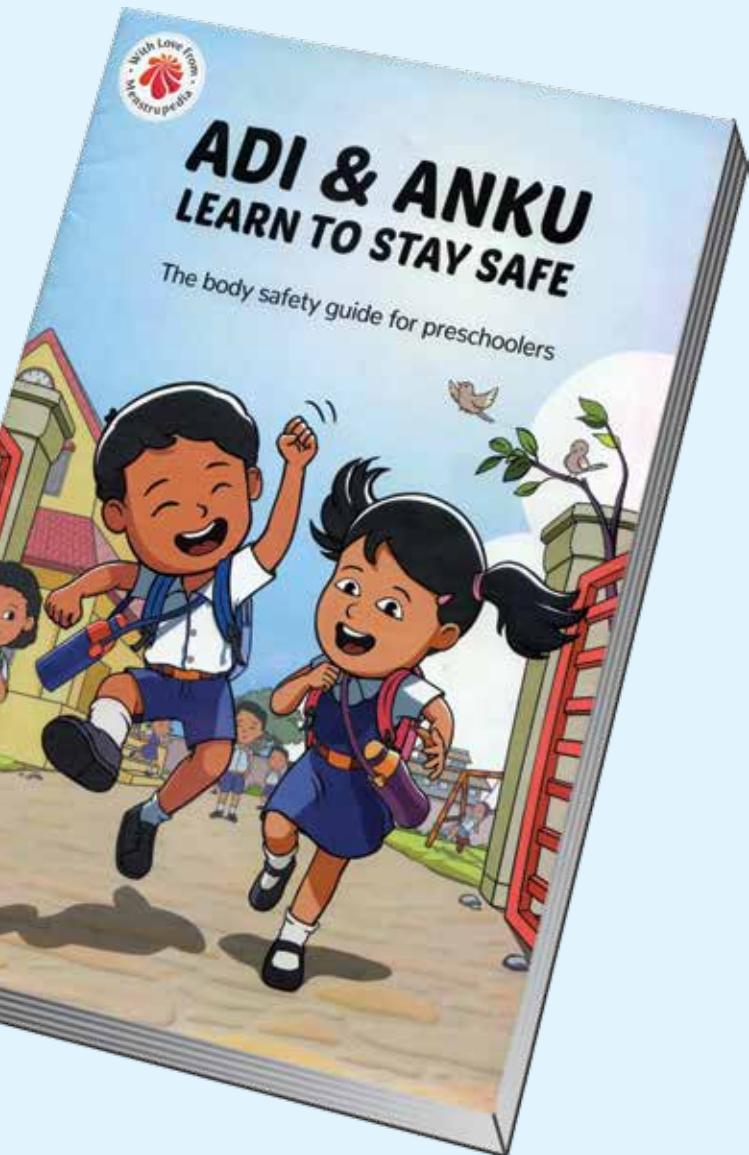
The 'Notes for parents and teachers' also states 'maintain open and positive communication with the child on a daily basis'. This is needed for sure, but how many adults, we wondered, engage with children in this manner?

Parents, and a grandparent, tell a child that an adult, and a familiar person at that, can cause problems and ask him to go away! This – labelling an uncle as unsafe and shooing him away – is no small step in books for children! This, familiar adults



me not!

and Nimesh Ved



Adi and Anku

Learn to stay safe: The body safety guide for preschoolers

Authors : Aditi Gupta and Tuhin Paul

Illustrators : Tuhin Paul, Aishwarya Shah, Siddhanth Verma

Publisher : Menstrupedia Technologies Pvt. Ltd.

Pages : 20

Price : Rs. 295/-

Where to buy: Teaching your kids about body safety made easy with "Adi & Anku" (menstrupedia.com)

causing harm to children, is a statistic that troubles many but few talk about. Even in our movies this rarely finds place – Meera Nair's *Monsoon Wedding* (2001) and Imtiaz Ali's *Highway* (2014) had depicted this issue with some panache. *Adi and Anku* talks about this issue plaguing children, and to its credit, does so without sensationalizing. Does this indicate that we, as a society, have walked some distance on the road?

As we read and reread the book, it struck us that we do not pay due attention to children's conversations! Or, do we? Do we listen to children without interrupting them? Do they trust us enough to discuss uncomfortable issues? Do we assure them that we are with them – whatever the situation?

In our school

We have *Menstrupedia* (2014) and *Gulu* (2021) in the book room in our school. They have helped us in our discussions on gender and sexuality – with colleagues and children. Both these books we briefly introduced and kept multiple copies in the open for children to read, go through, and turn pages. These books today are popular among children – 'they do not have stories but talk about real life issues' is how the children refer to them. They are amongst the books that are worn out; in other words, books which have been read and re-read. These two books have helped children formulate and ask questions that they have wanted to ask! Questions on issues that nag them and questions they seek answers to!

These books have also helped us get out of our comfort zones and talk with children on issues that matter. We notice that these conversations, over a period of time, are evolving. *Adi and Anku* will gel well into these evolving conversations. It will help not only enable the younger children to become a part of these conversations but also the overall conversations to move to the next level.

Adi and Anku had just arrived at the school when children of classes 7 and 8 took it. Their only complaint was that it ended too soon! We found the use of NO, GO, and TELL striking!

This book is useful or rather a must-read for adults – both teachers and parents. It encourages readers to get proactive on the issue of good-touch and bad-touch and not shy away from it.

The authors enjoy being amidst children, books, and music. They can be reached at
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Grisly tales from Indian history

Sheel

Most narrations of history, whether popular or scholarly, pay scant attention to the very human feelings and passions that inform people's choices and goad them into action; textbooks, in particular, bury them under a litany of dates and events. *Rogues and Rajas: Dark Tales for Tumultuous Times* is a collection of little-known tales from Indian history that bring to the fore the workings of individual desires, ambition and political scheming, and their impact on the direction that history has taken. S V Iyer delves into the stories of several illustrious people who lived in the centuries before 700 CE, bringing a magnifying glass to specific events in their lives and giving us unexpected vignettes of the human mind distended by powerful feelings – and its sinister harvest.

First of all, though, Iyer's preface pays a homage of sorts to the amalgamation of cultures by invoking goddess Saraswati as a minuscule muse springing out of a bottle, as if she were a genie. The opening story is also more cultural than political – it takes us to the beautifully carved temple at Suchindram (in present-day Tamil Nadu). A Nataraja dancing on his hands is the stimulus that prompts a king to engage master craftsmen to decorate the temple's walls and pillars with fabulous sculptures. Underlying this beauty is a tale of distrust and suspicion, of the lust for gold and its chilling consequences. The protagonist of the next story is the Chola king Karikala – the king with the charred leg. We learn how the leg came to be burnt, and how it was that this adverse event transformed a hesitant young prince into an illustrious ruler whose name is still remembered many centuries later.

Thenceforth, tale after tale shocks or perplexes the curious mind: How did the astute Chanakya die? Why did a talented litterateur like Gunadhyā destroy thousands of verses of his own work? Would a queen exterminate her own progeny to retain power over a kingdom? What could make a king banish his own offspring forever? And who would have thought that Ashoka 'the Great' was not the tall, stately soldier of the comic books, but a "stunted [man], pumpkin-faced and covered in blotched, flaking skin"! A man who so revelled in cruelty that he used the descriptions of hell in Buddhist literature as a blueprint for a torture palace. The book brings together tales from all over the Indian subcontinent, from Taxila to Bengal, from Kashmir to Kanyakumari, and even Sri Lanka, weaving together a tapestry of passion and power, of scheming, plunder and even murder.

At first sight, such tales may not be what we would like to present to our students, especially at a younger age. 'Chanakya-niti' may be a common phrase in our culture, but the story of how his tactics helped Chandragupta Maurya become king is glossed over in schoolbooks and comics meant for children, and justified by painting the Nanda king decadent. Similarly, the story of Chanakya's grandson Radhagupta and his machinations to make Ashoka king by getting rid of his own brothers (one of the tales related here) is pushed under the carpet.



Rogues and Rajas offers a fascinating compendium of tales anchored in Indian history that are sure to enthral...

DR SHASHI THAROOR

ROGUES AND RAJAS

DARK TALES FOR TUMULTUOUS TIMES

SV IYER

The question is whether we, as teachers, want our students to learn life lessons: if yes, then these stories can serve as a great way to share insights (at middle and high school levels) into how negative emotions such as greed, jealousy, fear, anger, guilt, shame, grief and hatred lead people to behave and thus influence the course of events. Teachers can share these stories and pose a series of 'What if?' questions to get children to think about what they might do in such situations, and ruminating upon how the direction of history might be different with alternate choices. What's more, we can get the children to think of current situations right from the home to the nation and thus lead up to their becoming more aware of power games, politics, and the political process.

One also comes across interesting questions on the side – does twin telepathy exist, as the story of the twin kings Hiranya and Toramana of Kashmir suggests? Do the predictions of astute astrologers and wise men really come true? Can philosophy or spirituality truly show us a way to prevail over the vagaries of the human mind? What to do when religion itself is turned against humanity? Each of the 15 stories in this collection also encourages us to delve into the complexities of human existence beyond the portals of power.

I read this book the morning after Arvind Kejriwal (the chief minister of Delhi), was arrested in what has been called the "liquorgate scam." Since then, a host of other dark tales have been surfacing every few days – these certainly are tumultuous times.... While S V Iyer's book pronounces no judgement on the current political scenario, it does make us aware that political machinations have always been a part of history, whether in the past or as it is being made.

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Rogues and Rajas Dark Tales for Tumultuous Times

Author: SV Iyer

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Championing creativity in the classroom

Aruna Sankaranarayanan

In the previous two articles of this column, I discussed how teachers may foster curiosity and compassion in the classroom. Today, we will delve into a third 'C' that is also elemental to human flourishing but isn't necessarily emphasized in mainstream schools. Creativity, or the ability to generate and choose original ideas or solutions that are valued by a discipline, is applicable to all fields or domains and is linked to having deep wells of curiosity. Contrary to popular perception, creativity is not limited to the arts, like music, painting and theatre, but extends to all disciplines from physics, to history, to economics. As Martin Robinson states in *Trivium*, "Creativity is neither the sole preserve of artists nor are all artists necessarily creative."

In *Creativity*, psychologist Csikszentmihalyi points out that creativity does not reside "inside people's heads," but results from the synergistic "interaction between a person's thoughts and a sociocultural context." For creativity to emerge, three interlinked facets need to be present. First, creativity manifests within a domain, be it fashion design or quantum computing. Next, a field of experts in that domain act as "gatekeepers" or serve as judges of a body of work. Finally, a person working within a domain produces a novel idea or product that is deemed original by the field. Thus, creativity is not about unhindered expression or simply being set free or letting go. In fact, Robinson argues that constraints are an endemic feature of the creative process.

Characteristics of creative individuals

Csikszentmihalyi profiles the characteristics of creative individuals. Most of them have unusual amounts of energy or grit to work hard. Contrary to lay belief, creatives don't just tap out a melody or solve an intractable math problem effortlessly. Creative works don't result from pure inspiration but require years of sweat and toil. While creative individuals typically have above-average

intelligence, IQs beyond 120 don't seem to confer further advantages to them. In *Creating Minds*, Howard Gardner adds that though creativity and intelligence are correlated, the two constructs are not synonymous.

Original thinkers, movers and shakers also tend to exhibit complex personalities that often house



Illustrations: Soumya Menon

contradictions, says Csikszentmihalyi. For example, though creative people are unusually disciplined about working, they also combine elements of playfulness into their work. According to Gardner, even Sigmund Freud, the father of modern psychology, noticed similarities between children's play and creative processes. While creative people are inordinately passionate about the problems or tasks they're working on, they're also able to detach from them to judge them objectively. However, in *Originals*, Adam Grant notes that even creative geniuses have difficulties predicting which of their works will be a hit or a miss. So, whether an idea or work is regarded as creative ultimately rests on how the field responds to it.

As all creative journeys are marked by crests of achievement and troughs of doubt, creative individuals have to brace themselves to ride



these emotional peaks and valleys, observes Csikszentmihalyi. Original thinkers are also self-assured and self-critical. Due to the former, they're able to plough on with their novel ideas; however, without the latter, they cannot critique their own work. Interestingly, they also marry a traditional outlook with a rebellious streak. Because creative works build upon previous knowledge in a domain, creative thinkers first need to understand the constraints and demands of their field. At the same time, they inject novelty and shift paradigms by questioning accepted norms.

The creative process

Csikszentmihalyi identifies five steps that constitute the "creative process." In the preparation stage, individuals become conversant with major issues, themes, and problems that define their field. In the incubation period, people may generate ideas and solutions, often at a subliminal level. During the third stage, eureka moments enter the level of consciousness and a person gains insight. Next, the person has to assess the ideas and judge whether they are "valuable and worth pursuing." The last stage of elaborating on the ideas is possibly the hardest and the longest.

Csikszentmihalyi's seminal contribution to the field of psychology is his concept of flow which he describes as a "state of consciousness" wherein individuals are completely immersed in a particular task that they lose track of time and even themselves. Gardner also notes that creative people invest a lot of time pondering over their work and are driven by intrinsic motivation. They often report undergoing this "optimal experience" while working. According to Csikszentmihalyi, when a person is in flow, they have clear goals of what they want to accomplish and are able to assess if they're progressing towards them. The demands of the task also mesh with their skill and knowledge levels. Likewise, Gardner observes that creative individuals harness their strengths. During flow, they work with an intense focus and are not worried about failing.

How teachers can foster creativity

Gardner and Grant highlight that creatives are very productive, churning out both outstanding and suboptimal work. While they are known only for the former, we should remember that great minds also produce subpar work. This point is especially relevant when we are nurturing young minds to be creative. We should encourage children to be prolific instead of pressuring them to produce stellar works.

Additionally, creativity in adulthood stems from childhood experiences. When children are allowed to explore in unfettered ways and are not hemmed in by fear or adult injunctions, they gain a “capital of creativity” that Gardner avers they can mine in adulthood. Children who tinker with toys, meander down rocky paths looking for stones and bugs or those who stage puppet shows with homemade props are more likely to make creative strides as adults. Both parents and teachers need to give time and space to children to wander and wonder.

While creatives need in-depth knowledge in their field, Grant points out that they also benefit from having a broad array of interests outside their discipline. Allowing students to dabble in diverse subjects and hobbies that interest them may help them gain unusual perspectives. Grant also finds that exposure to varied cultures promotes “flexibility and adaptability.”

Echoing his famed theory of multiple intelligences, Gardner observes that creators differ both in their “dominant intelligence” and the “combination of intelligences.” So, teachers need to be aware that children too will present unique profiles of “intelligences.” Both Gardner and Grant argue that most people who are creative as adults weren’t prodigies as children. So, giving children time to explore and discover the domain that they’re most comfortable in is what educators can do. Exposing children to role models and learning about their creative journeys can also imbue children with confidence to think differently. Gardner also mentions that creative individuals benefit from having a mentor who provides both emotional support and domain-specific feedback.

Finally, we need to encourage students to question. In his book, *Originals*, Adam Grant writes that the “hallmark of originality is rejecting the default,” which starts by asking “why the default exists” in the first place. Unfortunately, in schools, when students challenge established mores, or the status quo, adults often view these children as rebellious. According to



Grant, children who exhibit creativity are usually not the “teacher’s pet.” By creating a classroom climate that welcomes all questions, including, perhaps, some uncomfortable ones, we let students develop a critical voice that may later spur creative insights.

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